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# USSR Report

## NATIONAL ECONOMY

EKO: ECONOMICS AND ORGANIZATION OF  
INDUSTRIAL PRODUCTION

No 10, OCTOBER 1986

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USSR REPORT

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Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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## ZIL GENERAL DIRECTOR INTERVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 3-14

[Interview with Ye. A. Brakov, general director of the ZIL Production Association, by L. Shcherbakova: "The ZIL: Capabilities, Concerns and Accomplishments]

[Text] The concept of acceleration of the country's socioeconomic development requires being armed with everything that is progressive that has been accumulated by our industry. A special role here is allotted to the economic services of the enterprises. They are the primary ones and at the same time they are one of the main structural units which bear responsibility for the organization of the implementation of the program set forth by the 27th CPSU Congress. As was shown by the discussion on the pages of EKO during 1983-1985 of the problem entitled "The Economic Service of the Enterprise and the Management Mechanism," the readers are very interested in the structure, functions and positions of economic services in the system of production management. In their letters, many of them, while expressing their wishes and suggestions concerning improvement of the work of economic services, at the same time request that EKO publish more detailed material on this subject. In this issue we are offering for the readers' attention a selection of articles about the economic school of the ZIL.

[Question] The scale of your association, of course, is impressive: 16 branches, 230 subdivisions, tens of thousands of workers.... What motivated the leadership to create such a large association?

[Answer] Only the desire to fulfill the production program as well as possible! Of course, it is difficult to work in such a large association, but it would be much more difficult, immeasurably more difficult, if we were working through cooperation and with enterprises of both the automotive industry and other branches. We actually cannot influence the suppliers; we do not have the levers for this. The ministry does not have them either, and

moral influence produces no results. I shall give the example of the Michurin plant of the Ministry of the Automotive Industry, which specializes in the output of piston rings. From year to year the enterprise regularly fails to fulfill the plan--there are no controls of any kind on it. And there was absolute justification for the tack taken by P. D. Borodin who, having become director of the Moscow Plant imeni I. A. Likhechev, began to create the ZIL Association in its present form. He also became the first general director of this association. We are continuing to develop this line.

[Question] As you know, the ZIL has been granted the rights of a main administration. How real are these rights? How are relations arranged between the ministry and the ZIL as the main administration?

[Answer] I cannot see any significant differences between the activity of an ordinary association and those of an association which have the rights of a main administration. To be sure, one level has disappeared in our relations with the ministry staff. And, moreover, we have the right to create and accumulate reserves.

[Question] And do you have more freedom to make decisions than an ordinary association does?

[Answer] No, I would not say so. We are impeded by the functional style of the leadership which has taken form in the ministry. There is no single official there who organizes the solutions to all problems related to the ZIL. If we need to solve problems of material and technical supply we go to one deputy minister, economics--to another, technical reequipment to a third, and construction--to a fourth. And then it is necessary to coordinate all those decisions.

[Question] Do you think that the size of your association is optimal or has it reached the limits of controllability?

[Answer] A difficult question. I think that we have almost reached the limit of controllability. It is, of course, very complicated to control such an association. But we cannot develop in any other way. Now the association is faced with a task of state importance of changing ZIL trucks over to diesel fuel--the dieselization program. Having weighed all the "pros" and "cons," we arrived at the construction of a diesel engine plant in Yartsev, we are constructing a plant for cast iron in that same city, and we are constructing a fuel equipment plant in Zhitomir. These plants should be started up without increasing the number of workers. Difficulties in management will increase but we will be confident that the necessary components and sets of equipment are delivered. When carrying out an important national economic task we want to ensure ourselves against all kinds of accidents.

[Question] Yevgeniy Alekseyevich, what is the proportion of management staff in your association?

[Answer] One of the lowest in the branch, about 11 percent. How has this happened? When organizing the association it was possible to create a board of general directors and abandon the board of directors of the head plant.

But we did not take this path. Otherwise, the management staff of the association would have been transformed into this same administration. The board of general directors has real power--the material base and resources, which we dispose of indirectly, and it is much closer to production and has a better sense of its needs.

But then the load on each of us has increased sharply and still 13 plants were added (three in Moscow were also previously included in our association). And since the load had increased and also, consequently, the cost of a management decision, there was also an increase in the role of correctly selected management personnel. In such an association, along with other factors, there should be an increase in the influence of the personality of the leader. Otherwise the association can fail and be turned into a system where the subordination to the chief is purely nominal and his influence on his subordinates is very weak.

[Question] But still the influence of the personalities of the managers alone can hardly make the association a unified agency which is operating smoothly to produce a specific motor vehicle....

[Answer] Of course not. Therefore we intend to develop specialization within the association in the following way. At the head plant we have concentrated design, planning and engineering services and productions that decide the basic tasks for the whole association. Therefore the head plant specializes in the development of the main directions and the implementation of the technical policy, the production of a number of components and units of motor vehicles, the assembly of the basic modifications of the motor vehicles, and the production and supply of the entire association with instruments, fittings and equipment.

It is becoming increasingly typical for plants of the association to have specialization (object or technological) in combination with a high technical level and the introduction of modern technical equipment and technology. The latter is especially important now when a radical restructuring of production is in process.

[Question] And so in essence we have already begun a discussion of the branches within your association. But these branches, as it were, are responsible in their activity to more than just the ZIL. They are in various oblasts and even republics of the Soviet Union. And, naturally, they do not "come under the tutelage" of the corresponding soviet and party agencies. Do some additional difficulties arise because of this?

[Answer] We have gone in the direction of building in other regions of the country because there are no possibilities of expansion in Moscow. But an essential difficulty has arisen, which you quite correctly mentioned. Our branches have turned out to be under something like "dual jurisdiction"--the board of general directors and the local soviet and party agencies. There is nothing special in this fact, and each has its own range of duties and problems. But the local agencies frequently make branches responsible for solving them without taking the association into account. Moreover, the final goals of the association do not always interest them. We have calculated what

it costs the association each year to divert transportation from the branches at the request of the local agencies. According to date for 1984, transportation services provided by the association to outside organizations, from the price list, should be valued at 800,000 rubles. But the association has received only 40,000 rubles for performing this work.

Workers of ZIL branches perform an entire complex of work for building up the cities in which they are located, constructing and repairing roads, cleaning the streets and so forth.

Each year 1,000 or more people are sent from almost every plant to do agricultural work. In order to compensate for the almost constant lack of workers in production it is necessary to organize additional shifts and overtime work. It is frequently necessary to render literally "emergency" aid to the branches: in the summer of 1984, for example, 300 people from the head plant and other branches were kept in Serdobsk to repair equipment. But at that same time 500 people had been sent from the Serdobsk branch to do agricultural work....

The introduction of new technical equipment and progressive technology in the branches, in spite of all of our efforts, is not proceeding as quickly and effectively as we would like. As you know, a great deal here depends on the builders. And they are under the jurisdiction of local agencies. Each oblast has a plan for construction and installation work, and the leaders of the oblast, depending on the situation, earmark which facilities must be started first and which can be put off until later. Of course we do not know about these instructions, but with time we suddenly discovered that, in spite of all our agreements, our construction is not progressing. We meet with the builders, we conduct serious negotiations, we obtain a promise to start the work—and again nothing happens. The contract is broken and the funds which we have obtained with such difficulty from the Gosplan, "flowed away." And how and on whom does one exert influence in such cases? They can say: "Everyone has his own problems." Yes, we also have our own, but nobody is producing our trucks for us!

The main problem: bringing the branches up to the level of the head plant in terms of technology and the organization of production and labor. Our branches can be divided into two groups. Some plants were planned, constructed and equipped by the association. Others were independent enterprises and entered the association at various times. Hence the various approaches to solving the main problem in the initial stage. For enterprises that have been included in the ZIL, basic reliance was placed on technical reequipment, specialization and a sharp rise in the technical level of production. For plants that were constructed by the association itself, the main task is to achieve the planned indicators.

A branch requires support in the technical and other areas. Where will it be more effective? Of course, as part of a large association that is carrying out tasks at a state level, such authoritative ones as the ZIL. We distribute the funds we receive among the branch plants. Each of them participates in solving a statewide problem. This fills their activity with new content.

[Question] What does the patronage of the head plant over the branches consist of?

[Answer] You have put it correctly: patronage. You see, if an independent plant is constructed in a small city it is unsteady: there are no skilled personnel or a collective. Our task is to transfer to the branches the large amount of experience of the head plant concerning management and organization of production, and raise the level of their work to that of the head plant.

The head plant has rendered and does render to the branches direct assistance with technical equipment, personnel, adjustment and repair of equipment. Now, however, reliance is being placed on assistance the plants render to one another. The concept of "patronage" is gradually being replaced by the concept of "mutual assistance." Everyone already understands that the plants of an association are like fingers on a single hand. If any of them is cut it is painful. Each branch is interested in the good work of the other plants and of the association as a whole.

Local prejudices recede into the past. In the foreground are the interests of the association as a whole. What is advantageous to the association is also advantageous to each branch included in it. Such a statement of the problem provides for the vital interest of each branch in the final result and in the success of the association. We have examples of this kind of establishment of collectives in our association. The Mtsensk Plant was very burdensome, but now it has good indicators of its work and a collective has been formed. The same thing can be said about the Roslavl Automotive Aggregate Plant. It should be noted that we have a whole number of plants which are operating well, for example, the Smolensk, Petrovks, Penza and Ural plants.

[Question] What methods are used by the Board of General Directors of the Association in working with the managers of the branches?

[Answer] First of all, we try to make an objective evaluation of their activity. Gathering, for example, advice from directors, we try to send the head specialists of the association to plants in order to evaluate the situation beforehand.

[Question] Experts of a kind....

[Answer] Yes. If we see that the situation in the branch is deteriorating we render technical assistance, analyze the methods of the manager, search for weak places and influence him, and we send specialists--deputy general directors for economics, personnel and specialists in technical services.

[Question] It turns out that you have a kind of management consulting within the association. This is very interesting and, I think, useful for managers of large associations. But let us return to the association as a whole. What basic problems, in your view, are in need of an immediate solution?

[Answer] The first thing is acceleration of scientific and technical progress and its real influence on the activity of the enterprises.

While participating in the work of the 27th CPSU Congress each day I was convinced of the correctness and timeliness of the party's categorical requirement to provide for accelerated introduction into production of the latest achievements of scientific and technical progress. Only under this condition will it be possible to raise our national economy to a principally new level.

Go to any domestic industrial exhibit. There all scientific and technical progress is represented in experimental models. It shows what we can do, but we must do it. A machine tool is exhibited. A good one? Yes. And can you deliver us 100 of them? They hem and haw. No, this is an experimental model. Who produces it? We do not know. And where can one find out? Here the discussions are broken off. Our exhibitions do not have a commercial side, which they should engage in first and which is the strong side of foreign exhibits.

The practice of our work shows that it is necessary to develop machine tool building at more rapid rates, to purchase licenses and to construct first and foremost plants not for the production of raw material, but for the production of equipment. So far we are always "covering up" problems and trying to keep abreast of events. And yet we have a large army of engineering and technical personnel, branch scientific research institutes and design bureaus. In my opinion, the organization of their work does not correspond to the requirements of the day. The existing practice of developing new items does not correspond to them either.

It would seem that the specialization of design bureaus is good. But this is only at first glance. What happens in practice? One institute plans electrical equipment for an automatic line, another--hydraulic equipment, and several plants manufacture the line. As a result we obtain a set of equipment that does not suit us at all. We take this "line" and set it right at the plant. The workers have all the products, but the set of products as a whole they do not have. And not one of the manufacturers can be held responsible. Everyone blames his neighbor.

Moreover, the lack of a unified direction in the development of the electronic systems for controlling equipment in the country leads to a large diversity of these systems which, in turn, requires the manufacture of a large quantity of designs of plates for repair purposes.

And a good deal of time is spent on coordinating complex lines. We should somehow take you on the next trip through the various levels so that you could see how the deliveries of these lines are coordinated and you will see all the difficulty and lack of coordination in this work.

[Question] Thank you for the invitation. But where do you, Yevgeniy Alekseyevich, see the solution to the problem?

[Answer] The solution lies in the creation of a service network. We are now working with the Ivanovo Machine Tool Building Association on introducing flexible production systems. On the basis of such a plant we should create a firm which would unite the scientific collective, the production collective,

the experimental shops and the service. This would be very good. You would send an order to the firm and they would do it all for you from beginning to end.

Closely associated with the problem of scientific and technical progress is another problem that is bothering me today: training personnel and increasing their qualifications. We should not spare any money on this. Our worker as compared to the worker in any capitalist country has the advantage that he is literate, he has a broad world view and a wide range of interests, he is well read, and he can understand questions of policy. This is excellent....but he is lagging behind in occupational training. It is not the worker who is to blame for this, but the system of training in an occupation, which is sometimes arranged absolutely incorrectly. When training a worker we go into general issues, we teach everything but little that is concrete. The entire technical "arsenal" of the teacher is chalk and a blackboard. And yet there is a principally different approach to training which is based on a broad change in the technical means, electronics and automation. To improve the training of personnel at our plant we have put into operation a special classroom which is intended for training in an entire number of specialties related to pneumatics and hydraulics. Display screens and special stands are used extensively in it. The orientation is toward a deep and visual study of the subject.

The next problem is labor discipline. If it remains at the previous level we will not be able to develop at rapid rates. Of course we are trying to work with the collective in this direction. But our work must be supported by the system of economic influence. It is necessary to restore the system of payment for length of service, perhaps adding something to it. The following suggestion is not without foundation. If the worker or engineer has gone to another enterprise, let him begin from the beginning. But now--and EKO has written about this--in a new place for the same work or less a specialist or worker will receive more wages. This speculation must come to an end.

In connection with this, there is another critical problem for ZIL: labor turnover. At the head plant alone we annually hire and fire about 6,000 people. About 6,000 are temporary workers (patients in the drug abuse facility who come for 2 months from other regions of the country, including from the South). There were frequently leads to an increased number of breakdowns of the equipment and violations of technical and labor discipline. I think that it is necessary to reduce the number of jobs everywhere. In Moscow, for example, we have many jobs for skilled electricians where they simply stand guard and change light bulbs, receiving wages for essentially nothing. And idleness undermines their moral fiber.

[Question] Incidentally, about wages. Probably the wage policy does not contribute to reducing labor turnover either. I know that at your head plant, for example, the average wages of an assembly worker on the main conveyor are 190 rubles, and at the GAZE and AZLK they are 240 rubles. How do you feel about this fact?

[Answer] A painful question. About 10 years ago, taking into account the high intensiveness of labor, ZIL was at the wage level of the first five

related enterprises of the city, and now it is in the second 10. People go where they are paid more. Organizational measures are needed to solve this problem.

And one more problem is the expansion of the rights of the business executives. As you understand, this is not altogether within the authority of the association. In principle very little has changed in this respect, even with the changeover to the large-scale economic experiment and the new conditions of management. I shall discuss just one aspect of this problem.

Commodity exchange among enterprises and nonfunded release of commodities are now prohibited. But it is necessary to prepare for such a system, for only then will the changeover be smooth. We receive about 10 percent of our materials through direct ties. We must help the suppliers do that which has not been completed by state agencies. Now this assistance has been prohibited, but the state's apparatus, mainly the Gosplan--is not doing all the work and is not carrying out its functions to the end. Hundreds of kinds of materials are not planned but they are used in the production process. How do we get them?

One example. A new plant in our branch was immediately allotted 1 billion rubles for reconstruction. But the ZIL has producing profit for the state for 70 years and it needs reconstruction, but we cannot acquire the funds for this.

We have a good deal of equipment which has been in operation for more than 25 years. It turns out that we have not earned the money for updating the equipment. But who can reproach us for poor work? We have always fulfilled the plans, produced an inexpensive automobile and produced profit. But where are the incentives for further highly economical work? There are none. Equalization prevails. And in fact an enterprise that is operating well should be in charge of the situation.

We need an analysis of how the enterprises are working and at what cost.... So far we cannot see who would do such an analysis, even at the level of the branch. The institutes here are engaged in parallel research. There are many scientific associates, but to little avail.

[Question] And, finally, my last question: What are the prospects for the development of the ZIL?

[Answer] Under the 12th Five-Year Plan we shall have to provide for the changeover to the output of diesel motor vehicles. In the production of trucks such a radical reconstruction happens once every 20 years, and this is under the conditions of increased production, while retaining practically all of the list of the previously produced products, and special attention will be devoted to the output of motor vehicles that use diesel fuel.

We are taking measures to develop instrument production. After all, 60 million rubles' worth of fittings must be manufactured just for a new motor vehicle. There will be a significant load on the design subdivisions. We are introducing robots into production, and there the organizational work will be

greater than it is with any other devices. Nobody can relieve us of the work of fulfilling current planning assignments.

We have arranged all of our economic indicators for the output of the new truck. This means that in the event of failure we shall not fulfill the plan for production volume or for other indicators. The fate of the association depends on how we cope with the problem for dieselization.

One of the critical problems is the problem of providing housing for workers of the association both in Moscow and in other cities. Because of the changeover to the new conditions of management in 1986 we wanted to use the fund for social and cultural measures and housing construction to increase the volume of housing construction and to do it by the internal financing method. But according to the provisions approved by the USSR Gosplan, we cannot increase the volume of housing construction in excess of that envisioned by the plan. We are interested in construction a youth housing complex, but we do not have the funds for its construction. This is a very crucial problem. It requires a solution.

But in general the attitude in the collective is aggressive. We are hoping not only to survive in this difficult situation, but also to come out of it honorably.

[Question] Our magazine and readers wish your glorious collective many more successes. And we hope to return to the program of dieselization.

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## ZIL ECONOMIC MANAGEMENT DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 15-25

[Article by A. I. Buzhinskiy, deputy general director of the Association for Economic Work: "The Organization of Economic Management of the Association"]

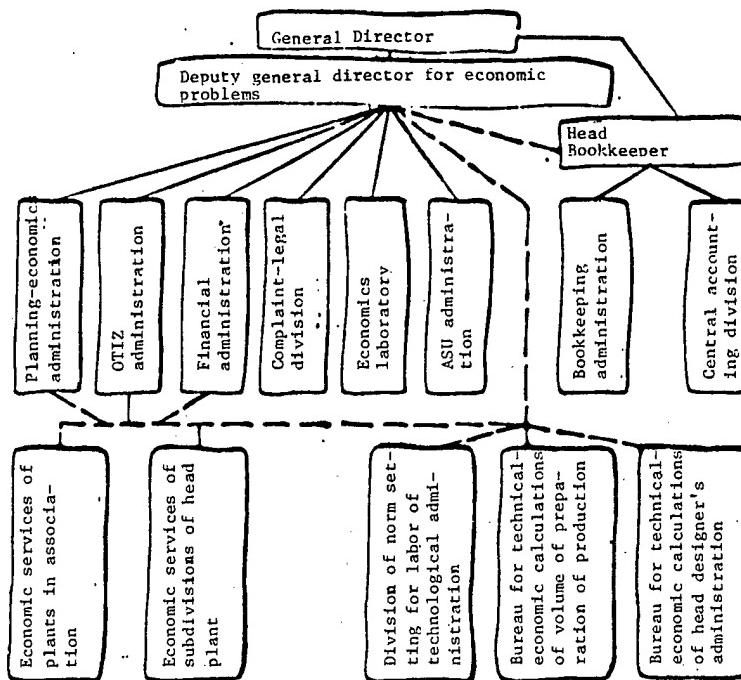
[Text] The ZIL is one of the few large associations in the country where all the enterprises, including the head plant, are production units (the smallest, the Simfreopol Automotive Repair Plant, has 300 employees, the rest have several thousand each, and the head plant has several tens of thousands). Such an organizational structure has made it possible, in our opinion, to realize the most important principle of effective functioning of a production association (PO)--the avoidance of repeated accounts. Unfortunately, a large percentage of the PO's even as of today have not been relieved of this.

If internal circulation is taken into account, the volume of the gross output of ZIL has increased by almost 25 percent. Of course the quantity of automobiles, spare parts, refrigerators and other items produced at the plant or manufactured at the head plant and in the branches would not increase from this, and the added "gross" volume would distort the picture of the association's economic development.

When many associations have been created there has been a clearly expressed desire to calculate the production volumes according to the Trestovskiy method, that is, including intrafirm circulation in the volume. Such a policy undoubtedly reduces the possibilities of utilizing capacities correctly and more effectively and efficiently determining the products list for each production unit. Moreover, the Trestovskiy method can motivate the association to strive to improve a number of indicators (production volume, growth of labor productivity, output-capital ratio and others) and sometimes direct them to inefficient organization of intrafirm deliveries. Special attention should be devoted to this when improving the mechanism for management of associations.

Of course, certain difficulties also arise from a method of accounting such as ours, and there are also certain contradictions between national economic and territorial interests. Territorial organizations are afraid of losing the production volumes (for the rayon, oblast or republic). But the final result

is important for intensification of the national economy. Excluding repeated accounting contributes to more effective achievement of national economic goals.



ZIL branches do not have independent current accounts. But the special subaccount and the current accounts that are at their disposal enable them to freely finance all the needs of production and economic activity and the development of production.

What have we gained with this approach to management? Because of it we have managed to create a unified production complex and to centralize the economic incentive funds. Hence the essential advantages--the possibilities of developing a unified socioeconomic program for the development of the association as a whole and all of its production units, and also the possibility of maneuvering funds and utilizing them expediently. If each branch were to create its own economic incentive funds independently and carry out reconstruction, technical reequipment or cultural-domestic construction with them, the work would be spread out over many years. With centralized economic incentive funds the association can maneuver them and determine the sequence for investing money in the solutions to various problems. And in the initial stage of the formation of the PO one can clearly trace the principle of the priority of the development of the branches over the head plant in order to raise their levels of technical equipment, technology and effectiveness. Therefore a relatively large proportion of the funds were used for financing the branches.

In addition to financial assistance, which is typical of the majority of associations, the head plant takes responsibility for scientific and technical guidance in improving the designs of items, technology and personnel training.

The success or failure of the activity of the association or enterprise, even with the existing shortcomings in the economic mechanism, depends largely on how economic work is organized and what positions questions of economics occupy in the activity of all production subdivisions and services of enterprises and PO's, especially technical ones.

And when arranging it a decisive role is played by the significance attached to it by the general directors, public organizations and management of the enterprise's engineering services. At ZIL economic work since the first years of its creation has always traditionally been at the center of attention of management and the party and trade union organizations. This tradition has fully extended to almost all plants of the association.

Cost accounting [khozraschet] occupies one of the central places in the system of economic methods of management at ZIL. Primary significance is now attached to it; for in associations like ours where not all production units have all the rights of a socialist industrial enterprise, cost accounting plays a special role and is the basis of economic management.

Cost accounting relations among branches and also among shops of the head plant are carried out on the basis of internal planned calculated prices. A great deal of attention is devoted to price setting in the association. Planned-calculated prices have been developed and price lists have been created for the basic products (items and spare parts) and products of auxiliary production (ZIL has its own production of machine tools, presses, nonstandard equipment, packaging and instruments). For purchased items (timber, scrap metal, metal and others--the PO uses unionwide prices, but we include them in a single price list.

It is apparently difficult to introduce internal planned calculated prices in small-series production, but in flowline and mass production their application is expedient and it completely justifies the labor expenditures required for the development of the price list. The price lists are revised and updated periodically. All this information is entered into machine bearers. Now one can call up any price on the computer screen when necessary.

Accounting and control of the results of cost accounting activity are carried out on the basis of planned normatives per unit of expenditures per item. Normative management is developed through the efforts of the functional services. Each service submits its own normatives to the information base of the ASU: planning and economic management--planned calculated prices, technological management--labor normatives, the division for norm setting for materials and analysis--material normatives, and so forth.

In the system of internal cost accounting, the following indicators have been introduced for the plant-branches, separate facilities and shops: the production plan in physical terms and in terms of product sales, singling out deliveries for internal circulation, cooperation, spare parts and consumer goods; labor productivity and the wage fund; and reduction of production costs. The indicator of profit is also planned for the plant-branches. Normatives of circulating capital are set for all association subdivisions.

An essential problem is cost accounting of functional and engineering subdivisions. It has been crucial for a long time and is related to the need to increase their management influence on solving the most important economic and technical problems of the PO. Unfortunately, the country does not yet have good methodological developments and little research is being done on this problem.

We began the introduction of cost accounting in the functional services with the service for material and technical supply. The evaluation and the stimulation of the results of its activity were made dependent on their own indicators--circulation of material values and economy of resources, reduction of supply outlays and the level of nonproductive expenditures, the meeting of the production schedule, and so forth. Fairly good results were achieved. The material and technical supply for production improved. Fines were reduced as were supply outlays.

Cost accounting relations among subdivisions of the PO are determined by the system of material responsibility, which includes sanctions against subdivisions which are guilty of additional expenditures and losses, and the policy is clearly determined for submitting complaints and making reimbursement for damage.

Recently a great deal of attention has been devoted to changing over intrashop subdivisions to cost accounting--sections, bays, brigades. Brigade cost accounting is the best developed. At the head plant it encompasses 40 percent of the brigades. Cost accounting of intrashop subdivisions includes indicators for those elements of the production cost which are the main ones and at the same time can be taken into account in one subdivision or another.

There is some fear that an excessive involvement in brigade cost accounting has now begun. It is not always expedient and not always. Pursuing the "cost accounting fashion" can only bring harm and compromise this important method of economic management. This can be illustrated with the following concrete example. The brigade assemblers of ZIL-130 automobile frames in the press facility consists of 30 people. It is a specialized shift brigade. The brigade does not expend materials--the frames are assembled from stamped and prepared parts; it is impossible to plan expenditures of electric energy for them and it is not necessary since the installation of meters and the organization of accounting are not cost-effective; the brigade does not use instruments that wear out quickly. There is only one item of expenditure left--wages, which, naturally, are planned and accounted for. Such a brigade can be changed over to cost accounting in name only.

The next principle of economic work at ZIL is close contact between economic and technical services and economic control of the results of scientific and technical developments. All design and technological administrations and divisions when introducing each innovation develop and coordinate technical and economic calculations with the economic service. Current design and technological changes in production, if they lead to changes in production outlays, must also be accompanied by a calculation which is signed by the deputy general director for economics. The goal of the establishment of this

policy is to link technical services more closely to the economic tasks of the association, on the one hand, and to bring plant economists closer to technical questions and increase their influence on technical progress, on the other.

The technical and economic services of the association have performed a large complex of work for passportization and certification of work positions. This work began in the association in 1980. They developed and experimentally tested methods for calculating the technical and economic indicators of work positions and nine forms of passports for work positions of production and auxiliary workers. The association drew up 17,500 passports and certified work positions in which 78,700 people were employed. There is no question about the effectiveness of the certification of work positions. In our association, where the technical supply for labor is fairly high and the level of technically substantiated norms is more than 90 percent in basic production and about 80 percent in auxiliary productions, as a result of this certification 1,113 people were released.

Bringing the economic and technical services closer together has made it possible to improve the methods for technical and economic calculations of the effectiveness of innovations and to avoid costly and ineffective developments. Unfortunately, in many cases the new technical equipment is not advantageous to production, although since the April (1985) Plenum of the CPSU Central Committee and the June Conference in the CPSU Central Committee concerning acceleration of scientific and technical progress, favorable changes have taken place.

There are economic units in all technical services. They are administratively subordinate to the manager of the corresponding service, and functionally--to the deputy general director of the association for economics. Such are the bureaus for technical and economic calculations of the division for technical preparation of production, the groups for technical and economic substantiation of items of the head designer's division, and the economic group of the planning division. Thus all problems of economic management of the association are concentrated in the hands of our service.

The economic service itself includes administrations: planning-economic, organization of labor and wages, financial, the legal division, the ASUP administration (computer center), and the laboratory for economics and organization of production.

The specific features of economic management of a large complex have made a certain imprint on the structure of the functional economic subdivisions. One should note such a principal aspect in the economic management of ZIL. Norm setting for labor expenditures in the PO is handled by the technical service and its division for labor normatives, and not by the UOTIZ. The division is also functionally subordinate to the deputy director for economics. Labor-intensiveness should be the responsibility of technological subdivisions, and then its reduction will be based on the acceleration of scientific and technical progress. This is another important lever for bringing technical services of the association in touch with economics. All the other functions of organizing labor and wages are carried out by the UOTIZ. The results of

reducing labor-intensiveness show the expediency of such an approach: with a planned labor-intensiveness for the ZIL-130 motor vehicle of 149.9 man-hours, as of 1 January 1986 it was 114.3 man-hours; and for the ZIL-131 the figure for 140.3 as compared to 157.3.

In the organizational structure of the PEO [Planning and Economics Administration] there is a special section for planning of plants, which is under the jurisdiction of one of the deputy chiefs of the PEU. Although it is not large--only seven people--it has made it possible to concentrate all of the work with the branches of the PO for economic planning in one center. This improves the coordination and, on the other hand, facilitates contacts between the branches and the association staff. The other PEU divisions, apparently, are like many large complexes--divisions for consolidated planning for the association as the whole and the head plant, planning of production shops, auxiliary shops and enterprises of the nonindustrial groups, statistics and analysis of prices, and the division for ASU PEU and the methodology of cost accounting.

So far the ASU subsystem of the planning and economics administration functions locally and relies on its own technical means and not on a common information common center. With the help of the computers the development of the plan has been regularized. Technical and economic planning for the association as a whole and for its plants has been switched over to the computer.

The ASU of the planning and economics administration is linked to the association's computer center. From its databank the PEU obtains information about the products list and the technological parameters of the items. The computer center, in turn, receives from the ASU PEU information about prices. Now the link between the ASU PEU information about prices. Now the link between the ASU PEU and the head computer is provided with a magnetic tape. Computer communications are needed. As software develops, the capacities of the head computer center and the computer center of the PEU will be coordinated.

As of today terminals have been installed in almost all of the divisions of the PEU. With time we will be able to install personal computers and complete the automation of the work positions of the economists.

The results of the work of any production collective are undoubtedly the result of an entire complex of measures in the area of improvement of technical equipment and technology, organization of management and economic work, technical reequipment and reconstruction. The PO fulfilled the plan of the 11th Five-Year Plan ahead of schedule and sold 168.2 million rubles' worth of products in excess of the plan. It successfully fulfilled the assignment for the products list and produced in excess of the five-year plan tens of thousands of trucks, 31.1 million rubles' worth of spare parts, and about 11,000 refrigerators. The five-year plan for profit was fulfilled by 110 percent. A large proportion of the above-planned profit was obtained as the result of improving product quality. Almost all makes of trucks are produced with the State Emblem of Quality. Losses from defective work were reduced during the five-year plan from 0.73 percent to 0.62 percent. Labor

productivity exceeded the planned level 1.5-fold and the increase for the five-year plan was 14.5 percent while the plan was for 9.9 percent.

By the end of the 12th Five-Year Plan we shall have to change over to mass production of diesel vehicles. In addition to the tasks in general improvement of the mechanism for managing the economic service, it will be necessary to solve many other concrete problems for reducing expenditures on the production of new vehicles.

The organization of economic management of the association or enterprise cannot be separated from the economic mechanism existing in industry and should be based on it. As was pointed out in Basic Directions for the Economic and Social Development of the USSR During 1980-1990 and the Period Up to the Year 2000, under the 12th Five-Year Plan all branches of the economy will be changed over to the new conditions for management. Our association has been working under these conditions since 1 January 1986. In this connection we have made changes in the system of intrabusiness cost accounting. Within the branches of the association the wage fund and the material incentive funds are formed according to stable normatives, depending on the increase in indicators that characterize the results of the work.

The inclusion among the fund-forming indicators of the one called "Fulfillment of the Plan for Deliveries in Keeping With Agreements, Orders and Contracts" was useful and corresponds to modern requirements. True, at the present time when summing up the results of the competition within the PO it is expedient to refrain from the requirements of 100-percent fulfillment of the plan for deliveries under contracts when the failure to fulfill contracts has not been the fault of labor collectives. For example, when summing up the results of competition how can one evaluate a collective that has fulfilled the plan for deliveries under contract by 99.95 percent. With the products list for deliveries of several thousand parts, if this failure had not been its fault?

In our opinion, the economic mechanism should not be the same for all branches and industrial enterprises. It should take into account branch peculiarities, the type of production (individual, series, mass-flow line), the sizes of the enterprises, and their proportion in providing with the national economy with the products they manufacture.

The 27th CPSU Congress has set the task of further improving management of the national economy. In our opinion, it should proceed along the path of reducing the existing indicators and applying economic normatives. The main thing is for the economic normatives and methods of forming them to create conditions whereby the enterprise will be forced to earn the money left at its disposal by providing for high final results.

The financing of simple and expanded reproduction within the framework of the association (enterprise) should be organized on the principles of self-financing. Experiments conducted at the VAZ and the Sumy PO are a step forward in this direction.

Improvement of price setting is a very important aspect. In order for the price to more fully reflect the actual consumer value of technical equipment

(for example, an automobile), it would be expedient to change the policy for establishing wholesale prices. It is necessary to get away from calculating the price on the basis of individual expenditures. With the expenditure method of price setting, the enterprises that end up in the best position are those with high production outlays.

The proposed measures for improving the economic mechanism, can and should be refined or changed, depending on the specific features of the branches and enterprises. For successful introduction of the economic mechanism it is necessary first and foremost to develop an integrated concept of how the economic mechanism for controlling an industrial enterprise and association should finally look, to present it, and from its positions determine the level of readiness of production for a graduate changeover to complete cost accounting. There is no doubt that economic and management personnel must be carefully trained for this.

In the ZIL PO an integrated system has been created for this which is headed by the Council for Economic Education. It encompasses all forms of economic training, beginning with the network of party education, circles and schools, and ending with the plant-VIUZ. A large proportion of the managers of productions and shops as well as many chiefs and foremen of sections and shifts have gone through the correspondence form of training in the economics department of the VIUZ. They have added to their basic engineering-technical education a second kind--economic. Permanent training in this department also takes into account the peculiarities of the economic mechanism of ZIL. Special courses and seminars on cost accounting, economic incentives and others are delivered and conducted by specialists of the PO. With large management and economic innovations schools and seminars are conducted for management personnel of the head plant and the branches. An entire series of 2-day and weeklong seminars was conducted in preparing for changing over to the new conditions of the management in 1986. The goal of these kinds of training is to reach a point where every worker in the association knows the meaning of the economic policy that is being conducted.

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#### MANAGEMENT METHODS RELATED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 26-32

[Article by V. V. Novikov, candidate of economic sciences, chief of the planning and economics administration of the association's Board of General Directors: "The Basic Method of Management." The article is a continuation of the discussion of problems of organizing intraplant cost-accounting--see EKO No 4, 1981; No 11, 1984; No 12, 1985]

[Text] In economic literature for dozens of years the discussion has first flared up and then died down: What is cost accounting? In our opinion the essence of cost accounting is one thing: to compensate for expenditures on the output of products and obtain income and profit. This concept lies at the basis of cost accounting relations at ZIL.

In recent years less attention has been given to cost accounting than it deserves. Therefore let us turn attention to the fact that cost accounting cannot be provided for simply by appeals, without the proper normative base. If we do not have norms and there is no measurement (this can be called the normative cost of processing, intraplant planning-calculation prices or normative production costs) which makes it possible to determine the volume of production and expenditures on it and then to coordinate these, then cost accounting is nothing but an empty word.

We shall single out four foundations on which cost accounting is based: a developed normative economy; a system of technical and economic planning; the availability of methods for accounting for and analyzing economic activity; a system of material incentives and material responsibility for the results of labor.

#### Normative Economy

This includes:

a list of parts, components and items produced by the subdivisions of the association's basic production;

a list of purchased semimanufactured products and items;

the composition of items, units and components (assembly schedules); technological routes for the manufacture of products of production subdivisions of the associations; part-by-part norms for the expenditure of basic materials; operation-by-operation norms for the expenditure of time and wages (for workers with piece-rate and time-rate payment); a list of wholesale prices and the normative net output of the association for products of the association; a price list of planning and calculation prices and normative net outputs of subdivisions for their products; price lists of retail prices, wholesale prices and planning-calculation prices for purchased semimanufactured products and the item, materials and wastes.

The corresponding services submit the normative information to the computer center. The computer center regularly makes adjustments in the normative as confirms that it is in working condition. Additionally, a number of normatives are created and introduced directly into the functional services of the association which have the corresponding electronic and organizational equipment.

#### System of Technical and Economic Planning

Why are we devoting so much attention to this? This is quite justified. Let us consider two methods of control: system, when the balanced plans are drawn up ahead of time, and nonsystem, when adjustments and corrections of shortcomings in the plan are made by nonsystem methods of prescriptions, instructions and so forth. If the plan is poorly drawn up, it will change and require an immense number of disposition documents in order to correct it. And the subdivision loses its point of reference. Is it necessary to fulfill the plan? Is it not possible to adjust it? Is it not possible to obtain remuneration with a small underfulfillment of the plan?

Our plans as a rule, are stable. Adjusting them is an exception to the rule. But in addition to adjustment there are changes in plans that are related not to requests from the shops and plants, but to a reduction of the output of a particular item or to the fact that an associated enterprise has violated an agreement and the output of products has to be taken on by the enterprise itself or there can also be a change in the plan made by the ministry. We allow changes in the plan, but not a change "for its own sake." And also when there is a change in the output plan there must be a change in the planning indicators for labor productivity, labor expenditures and so forth.

All subdivisions submit to the Board of General Directors tentative plans for the year and longer periods. This enables the plant administration to better take into account the concrete peculiarities and conditions for the work of

the subdivisions and also to give the management of the subdivisions a taste for economic substantiations of decisions that are made and also motivates them to search for and utilize internal reserves. The substantiation of the plans is also increased.

The normative base is the same for operational-production and technical-economic planning. The calculation of the indicators of output for the subdivisions of the basic production is done on the basis of part-by-part counting, based on a program established for the production association. The commodity list of the shop (plant)—parts, components, units and engines produced by the subdivision—is used as a products list for the plan. The items which the plant manufactures to assemble itself are not included in the production volume. Since 1977 the entire association has been working on totals printouts. Using computers we "spread out" the planned quantities of motor vehicles along the technological chain and we obtain two types of totals printouts:

"The production plan" (it contains information about the planned volume of output for all the basic positions in all the required measurements—wholesale, planning-calculation prices and normative net output); and "part-by-part plan" contains a deciphering of the total positions of the plan in a list of the individual parts). We have become accustomed to working from totals printouts.

The planning indicators for labor are calculated according to generally accepted methods. Here the labor-intensiveness of the production program and the proportional wage fund for production workers are also calculated on computers and the corresponding totals are printed out.

#### Organization of Accounting and Analysis of Cost Accounting Indicators

Accounting for expenditures and calculating the output of the basic production in all the subdivisions of basic production in the association are done according to the normative method. Thus the output of a subdivision is calculated according to the actual shop production cost, including semimanufactured products from other shops and plants of the association at planning-calculation prices. At all plants of the association the accounting is done by plant bookkeepers under a centralized policy. Additionally, we have centralized bookkeeping of nonindustrial branches of the economy.

In terms of the bookkeeping system and accounting Moscow plants of the association are equal to facilities and shops of the head plant, and plants in other cities are represented in the main bookkeeping balance with a reduced number of items. In order to carry out certain strictly determined financial operations, subsidiary special loan and current accounts are opened up for the plants in local divisions of the Gosbank. Accounts between the branch plants and the head plant are kept without submitting accounts to the Gosbank. A report on the results of the economic activity of the subdivisions is submitted in consolidated forms. Cost accounting indicators of all production subdivisions of the association are analyzed according to the results of the work for the month. Initially the analysis is conducted by the corresponding shop services, and then by the functional services.

## The System of Cost Accounting Indicators

Our principle is to establish for the subdivision those indicators which are established for the association. Under the conditions of an association as large as ours, this is completely justified. Of course these indicators can be revised and augmented within the association. Thus several years ago we planned an indicator of profit for all the subdivisions. But we began to encounter cases where the indicator of profit was fulfilled but expenditures were increased. And without waiting for changes in the intrabranch system, we changed over to planning the production cost as a basic indicator for the subdivisions. But the indicator which we establish as the basic one for the subdivisions should be decisive for the entire association as well.

If the normative net output were established for our association we would have created methods and informed the subdivisions of the normative net output. Now we have understood that this indicator, although it created an immense amount of additional work, produced no effect. If administrative and management expenditures are established for the association, we established them for the various facilities. Let us consider the basic groups of cost accounting indicators.

### 1. Cost accounting evaluation indicators of the basic production and facilities, shops of the head plant, and branch plants.

Fund forming: product sales, production costs, labor productivity.

Mandatory conditions for bonuses: fulfillment of the plan for the production of the most important kinds of products (trucks, spare parts for repair and operating needs, components and parts for batching and cooperation), cooperative deliveries of blank pieces, the provision of spare parts indicated in the products list according to the name on the list.

Adjustment indicators: the quality of products produced, the fulfillment of the plan for product sales under agreements and deliveries, the fulfillment of the indicator of the rhythm of release of spare parts, evaluation of the cleanliness and culture of production, the result of the expenditure of the wage fund, the fulfillment of the plan for profit and production of losses, the ratio between the growth and labor productivity and the average wages, the fulfillment of the plan for spare parts and cooperation in the products list.

Additional indicators: observance of the estimates of expenditures, the lack of an increase in fines from the beginning of the year as compared to the corresponding period of the last year, the lack of idle time of assembly conveyors, the availability of unsubstantiated above-normative supplies of commodity and material values, and the fulfillment of the plan for processing scrap metal and ferrous metal wastes.

### 2. Cost accounting indicators of shops for auxiliary production.

Depending on the nature of the influence on the final results of the operation of the association, the shops of auxiliary production are subdivided into two

groups. Material incentives for some are provided according to individual indicators of the work of the subdivision (instrument, repair-mechanic and so forth). Material incentives for others depend on the results of the work of the association as a whole and the fulfillment of mandatory conditions for bonuses (energy, transportation and so forth). In auxiliary production shops for the material incentive fund is formed depending on the fulfillment of the plan for the cost accounting indicators that are planned for them, they use the same range of indicators as are planned for the shops and facilities of basic production and the branch plants.

A stable normative base of shops of auxiliary production is provided through the development of long-range price lists that are conducted according to the group or individual principle. We have price lists for stamps for hot stamping, stamps for cold stamping, and normals press-forms, adapters, cutting, subsidiary and measurement mechanized instruments, metal forming and wood forming instruments, items and services of the repair-mechanics and electrical mechanic shops, containers, fittings and hoisting operations.

### 3. Cost accounting indicators for administrations, divisions and services.

In our opinion, cost accounting should be mandatory for line subdivisions (shops) where all expenditures are actually made and also functional ones. The basic ones include the fulfillment of the plan in terms of the most important technical and economic indicators for the association. Otherwise workers of the functional service would receive no bonuses at all. Each functional service has its own fund adjusting indicators, for example, the expenditure of the wage fund has become a general indicator. For the sales administration we have established the indicator of the fulfillment of the plan for product sales in keeping with agreements, schedules and orders that have been concluded.

The majority of the functional services have established for them the indicator of the fulfillment of the estimated expenditures on maintaining the administration (division). For the head metallurgist's administration they also take into account losses from defective work and for the technological administration--the fulfillment of assignments for reducing labor-intensiveness. The head energy engineering service has as additional indicators the continuity of the provision of all kinds of energy for the plant, the observance of estimates of expenditures, and the lack of idle time on the conveyor for which the service is responsible. Certain subdivisions are also awarded bonuses in the event of the fulfillment of the plan for new technical equipment, scientific research work and experimental design work.

### 4. Cost accounting indicators for supply administrations.

Functional cost accounting has been most fully developed in the work practice of supply administrations. Here the collectives receive half of their remunerations in the event of the fulfillment of planned indicators by the association and half for the fulfillment of their own plans. Thus a large remuneration is received both for good supply and for commercial work.

## The System of Material Incentives and Material Responsibility

In our association this system basically coincides with the branch system. It is effective but extremely complicated. There is an immense number of indicators. Branch agencies have tried to attach to cost accounting the cleanliness in the work position, the organizational and technical plan, and the culture of production, which is extremely questionable. The very meaning of the bonus is lost and the worker does not understand why he has received it. This is probably why people are more interested in how much they receive and not what it is for. Because of the large quantity of indicators, it is in any case impossible to explain the latter. I think that theorists should discuss these questions. So far we are receiving from the higher organizations rigid instructions and a system of material incentives that is confused by an immense number of indicators. Therefore the calculation of the bonus itself is also complicated.

Only engineering and technical personnel and employees receive material incentives for cost accounting. The workers receive nothing or extremely little (in the brigades). Of course their bonuses are much larger than those of other categories of workers, but they come from the wage fund for two indicators--overfulfillment of output norms and product quality. Cost accounting interest as such is eliminated. It appears only in the brigades. I think that there is no need to considerably increase the bonuses themselves, but it is necessary to link them to cost accounting.

Material responsibility is manifested in the withholding of bonuses and the application of fines and complaints. The results of the economic activity of the structural subdivisions are affected by harm caused to the association for failure to fulfill the plan for deliveries of products and the delivery of incomplete sets of products to outside consumers; the failure to release scrap metal; technical underloading of railroad cars; the failure to fulfill the plan for shipments and changes in the point of destination; idle time of railroad cars and containers belonging to the Ministry of Railways in excess of the established norm; late return of circulating (recyclable) containers; the delivery of poor-quality products; the overexpenditure of limits and estimated allocations; and the existence of nonproductive expenditures.

The changeover to the new conditions of management provide even greater incentive for the work of economists in the area of cost accounting. The greatest interest is evoked by the formation of material incentive funds for production units of the association and basic production shops of the head plant, depending on the growth rates of labor productivity and the reduction of production costs, and also the normative method for the formation of the wage fund for them.

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## ASSOCIATION'S BOOKKEEPING SERVICE DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 32-37

[Article by V. I. Sidorov, head bookkeeper: "The Association's Bookkeeping Service"]

[Text] With the increased significance of intensive factors in economic development, there is also an increase in the role of bookkeeping; its volume is increasing and its tasks are becoming more complicated. The fulfillment of modern demands made on the service for bookkeeping and control over production and economic activity in the association predetermined the organizational structure and work methods of this service at ZIL.

The service for bookkeeping and control in our association includes:

the division of accounting for production and calculation of expenditures;

the division of interrelations with branch plants;

the division for consolidated accounting and the balance;

the enlarged accounting division (for accounts with workers of the association);

the revision and methodological division;

centralized bookkeeping for accounting for nonindustrial businesses and sociocultural institutions.

In the sphere of production bookkeeping at the ZIL is decentralized except for accounts for wages of workers and employees. My personal opinion is that in a large association or at a large enterprise centralization of bookkeeping is impossible or inexpedient. Let us take the head plant. There are about 80 bookkeeping offices here--each one has a production facility and shop. In the facilities they have created bookkeeping subdivisions at the level of bookkeeping bureaus, and in the shops--at the level of groups. To remove bookkeeping workers from production means to remove them from initial information which is generated locally. In addition to the head plant we have

16 branch plants, of which 14 are operating and two are under construction. They are all production units with an incomplete balance and operate on the basis of intrabusiness accounting. If we were to centralize bookkeeping we would undermine the effectiveness of the intraproduction cost accounting. Cost accounting should rely on bookkeeping and have the same indicators. Only then is it possible to evaluate objectively the results of the production and economic activity of the subdivisions and enterprises.

But we have centralized bookkeeping subdivisions of nonindustrial businesses and sociocultural institutions in order to strengthen accounting and control functions in these small and isolated organizations which are on the books of the ZIL and to provide them with qualified personnel. We are speaking about kindergartens and day nurseries, boarding schools, rest homes, dormitories, housing and so forth.

The production facilities of the head plant are under the same cost accounting conditions as the branch plants. The only difference is that they do not have any current accounts in the state bank or subsidiary special accounts for commodity and material values. Otherwise their activity is arranged on the same principles of material responsibility and material incentives as the work of the branch plants is. And in terms of the number of workers many of these facilities of the head plant even exceed the branch plants.

All the bookkeeping services of the branch plants and production facilities of the head plant have direct ties with the services of the planning and dispatcher subdivisions. This is reflected in the fact that the data from operational accounting which is carried out by one or another planning-dispatcher bureau fulfilling the plan according to the products list, production volumes, and the movement of parts, blank pieces and groups of equipment are utilized in the system of bookkeeping. The movement of prepared parts, components and sets of units along the technological chain to be reflected in this system is documented by an "avizo"--a notification from the manufacturing subdivision of a change in the condition of mutual accounts with the consumer subdivision. If, say, a press facility sends to the forging production parts for assembling cabs, it reflects them in its bookkeeping accounts as expenditures and issues and "avizo." The forge production, when receiving the parts or components, includes them in its system of bookkeeping.

Bookkeeping at ZIL is kept on the basis of normatives. Each deviation from the norms is reflected in the bookkeeping document. Let us say that the wrong profile of metal has been delivered: instead of having a diameter of 48 mm it has one of 50 mm. The parts need additional processing. The corresponding permit is filled out by the management for additional expenditures--an order for additional labor expenditures and wages. The requirements for additional material values are entered into a blank form with a red line. Because of these documents not a single deviation from the normative goes unnoticed, and the attention of the managers is focused on them. In order to increase bookkeeping control over the observance of normatives of expenditures, in the forms for lower-level bookkeeping we have introduced information concerning deviations. This comes from all subdivisions to the deputy head bookkeeper who is at the same time the chief of the division for accounting and calculation of expenditures.

It should be stipulated that not everything has been arranged ideally yet. The work on improving normative methods of accounting is continuing. One must say frankly that the production subdivisions of our association, as at other enterprises and in other branches, are not interested in achieving above-plan savings on expenditures because of the fact that the assignments for reducing the production costs in the majority of cases are based on the level that has already been reached. There are also blank spaces in the normative methods of accounting themselves because of the lack of instruments of control and measurement and the inadequate qualifications of the workers. For information is generated in the work positions and a good deal depends on the lower-level workers who fill out the initial documents. These and other factors impede the development of progressive methods of accounting and to some degree explain why for many decades the introduction of normative accounting in the country has been proceeding at inadequate rates. But still we are convinced from our own experience that its development contains a great possibility of streamlining and saving on expenditures.

The bookkeeping administration works in close contact, on a unified methodological basis, with the planning and economics administration. Before introducing any indicator into intrabusiness accounting we jointly determine the possibility of accounting for the results according to this indicator. Unwavering observance of this principle contributes to increasing the effectiveness of cost accounting.

Our services are jointly searching for ways for planning and accounting for indicators of brigade cost accounting. Especially great difficulties appear in norm setting, planning and accounting for material expenditures for the various brigades. Material expenditures can be planned and taken into account when the brigade or subdivision has a closed production cycle. But if it does not, there will be no information about planned and actual expenditures because we develop our normatives for expenditures in terms of the final product. Therefore it seems to me that there is no need to be in any hurry with mass changeover of brigades to cost accounting taking material expenditures into account. It is necessary to think of measures for reliable accounting for their cost accounting activity. Otherwise the changeover to cost accounting will be superficial in nature. In our association the brigades working under conditions of cost accounting are mainly all-encompassing brigades of procurement productions that produce products that are final for them--casting, forged pieces and so forth, for which there are normatives of expenditures.

Bookkeeping is made difficult by the immense number of additional indicators and systems of incentives. Five years ago the form 12-SN, "Report on the Fulfillment of Norms and Assignments for Average Reduction of Norms for Expenditure of Raw and Processed Materials," consisted of 10 pages, and now it has 240 pages!

Incentive systems are sprouting like mushrooms after a rain. The amounts of bonuses in many of them constitute a miserly proportion of the amounts of the material incentive funds but they create great difficulties in calculating wages. We have more than 100 kinds of payments and bonuses--there are not

enough figures in the mechanized system for calculating wages. Some figures have to be combined. And even the two-digit code has turned out to be inadequate. It has been necessary to changeover to a three-digit one.

We have tried to draw attention to the solution to this problem from the USSR State Committee for Labor and Social Problems and the Ministry of Finance, and we have suggested methods that make it possible, from our point of view, to unify and simplify calculations and facilitate the work of bookkeeping services. Our proposals have not been accepted so far and we essentially do not know why. The differences in the sums of the average earnings calculated by the methods we have proposed and the complex differentiated calculations we have used have turned out to be less than a ruble. So is it worthwhile to make a fuss about the calculations? They must be simplified! The next important aspect of the work of the bookkeeping service is stepping up the protection of socialist property. In all subdivisions of ZIL there are lists of goods that are in especially short supply--material values which are inventoried each month. Prevention and efficient disclosure of losses make it possible to take measures quickly.

Of course it is not only the bookkeeping office that engages in this work. Warehousing is being straightened out at the ZIL. Automated warehouse complexes have been created and centralized circular shipment of material resources to the shops and productions has been organized on the basis of normative needs for products. But we still do not have enough warehouse space. Some cargoes are still stored out in open areas. Therefore we have accelerated handling and created operations groups of guards who have organized 24-hour guarding and supervision of the storage of cargo out in open spaces. The system of bookkeeping and control, for its part, is contributing to increasing the preservation of resources.

We have an inspection group. Although it is small and not fully staffed, once every 2 years it conducts an inspection of each subdivision. Unfortunately, the question of staffing this group is critical. There is no special training for inspection personnel in the country. Where do we find them? The more so since the occupation of the inspector is not prestigious. After all, his task is to reveal shortcomings. He frequently becomes the object of ridicule from those against whom legitimate complaints are made. Moreover the work involves traveling to various branch plants.

A personnel shortage is being felt in other bookkeeping subdivisions as well. In the ZIL Association there is a shortage of 20 bookkeepers. At the Yartsev Plant it was necessary to bring a bookkeeper in from another oblast. And even in Moscow the situation is no better. Colleagues from many Moscow organizations call me requesting assistance in finding a bookkeeper--the furniture factories, the automotive enterprises and others.

Workers in bookkeeping offices are placed in unequal conditions with respect to wages as compared to the planning, financial and other economic services, not to mention the technical ones.

When certifying young specialists graduating from the economics faculty of our plant-VIUZ we asked the question: "Would you not like to work as a

bookkeeper?" The simple answer: "No!" "Why?" "There is less pay and more work." Students of the plant-VIUZ become well aware of this during the process of production practice. As a result, during 1981-1982 21 specialists from the plant-VIUZ were placed in the bookkeeping service, and only four remained, of whom two are working as inspectors and have a salary at the level of economists. They are working out the mandatory period after graduating from the VIUZ, and according to their application, they will leave, since they have numerous opportunities in other economic services.

Recently measures have been taken for regulating the wages of head bookkeepers. But this does not solve all the problems. The USSR State Committee for Labor and Social Problems and the USSR Ministry of Finance must take into account the work of other workers in the bookkeeping offices, which is becoming increasingly more complicated, and also the disproportions that arise in the payment for their labor, and they must rectify the situation that has been created. Why am I writing about this? Because the bookkeeping services are left without skilled personnel. We all see the announcements "Bookkeeper Needed." The bookkeeping offices are happy to have any 10th-grade girl to fill in. Soon bookkeepers will be entered in the "red book." With the way things are the problem of staffing bookkeeping services with qualified personnel cannot be solved. Sooner or later it would be necessary to recognize this position as a more responsible one and eliminate the disproportions in the wages.

It seems to me that there is a simple solution: to extend to bookkeepers the existing provisions concerning an additional payment of 30 percent of the wages for combining the duties of absent workers, which would contribute to improving the quality and efficiency of accounting. Bookkeeping and control are weakened because of the shortage of qualified bookkeepers, and the values that are lost are much greater than the wages that are saved.

Increasing the prestige of bookkeeping also involves mechanization and automation of the procedures of bookkeeping accounting and control. Unfortunately, many bookkeeping procedures are done by hand. We have made suggestions to the association's computer center, but they do not have enough qualified programmers for bookkeeping, and our suggestions have not yet been fully realized. So we ourselves also have something to think about and to work on in order to increase the effectiveness of bookkeeping and control.

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DIRECTOR OF SMOLENSK PLANT INTERVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 38-43

[Interview with V. T. Otrokhov, director of the Smolensk Plant for assemblies of the ZIL Production Association, candidate of technical sciences: "Together or Alone?"]

[Text] [Question] Vladimir Petrovich, you were in charge of an independent enterprise for 14 years and have managed a branch for many years. You have had the opportunity to compare and evaluate which is better--together or alone?

[Answer] The problem of the position of the branches as parts of the production association is extremely multifaceted. And I think that the psychological aspect has always played and will continue to play a certain role in the evaluation of the situation. You will agree that it is not so easy for the director of an enterprise to let go of his independence in management. But it is not only a matter of this, not only the feelings and emotions of the manager must be taken into account, and it is not only on these that the attitude toward the status of the branches depends. In the final analysis, for every sensible manager the main thing should be the expediency of the organizational transformations. This is what forms the final evaluation.

During these years I have had occasion to observe how associations appeared, were organized and declined, and then were created again in a new form. Like the planets, they have appeared in the sky, then disappeared, then reappeared. Among them are ones which have been ones which are obviously weak, artificially created only to maintain the branch or territorial frameworks. Enterprises that have ended up in a production complex have sometimes had nothing in common with each other, either in terms of output or in terms of technology. Naturally, such associations could not survive and so they disintegrated. There were also associations for the managers operated according to the principle of developing the head plant above all. In these cases the branches withered quickly and even dropped below the level at which they had entered the associations. In certain PO's, conversely, there was excessive protection of the branches and then their managers ceased to display initiative. The enterprise became dependent.

ZIL is a more serious production association and can serve as a prototype for a real production complex. Therefore, to your question "together or alone?" I would answer: "Yes, together, but as parts of such associations as ZIL."

Before 1974 our plant was included in one of the main administrations of the Ministry of the Automotive Industry. Our higher level was a purely administrative management agency. The technical transformations of the main administrations had little influence on the future. But the ZIL engages in the development of its enterprises and, whether we like it or not, it is always pushing the branches forward in terms of economics, the designs of items and technology, and raising them to the level of production of the head plant. This is dictated not by any altruistic or benevolent considerations, but by a production necessity, since the branches are clearly specialized in the manufacture of units, assemblies and parts for motor vehicles and level of the vehicles produced by the association depends on their level. This approach enables the branches to experience their significance and role in the association.

Each branch has already been convinced repeatedly that it is given priority in development when the need arises. The economic principles developed in the association contribute to this. Thus when preparing for a changeover to the output of diesel vehicles, our plant had to undergo an immense reconstruction. If we had had our own fund for the development of production, we would have no more than 800,000 rubles a year. But in order to create a carryover supply for our assemblies, it would have been necessary to assimilate 10-12 times this amount of money for reconstruction each year. The association has a centralized fund for the development of production and ZIL earmarked and was able to give us for reconstruction in 1985-1987 24 million rubles from the centralized fund for the development of production. In other years this method has been used to finance the development of the Mtsensk, Roslavl and other branches. Concentration of funds has made it possible to conduct large jobs quickly.

Social and domestic problems are resolved in a similar way. During one year the money from the fund for social-cultural measures is used to help in the construction of housing and cultural-domestic institutions for one enterprise, and then for another. We now have a sanatorium and dispensary which can accommodate 100. In terms of the number of industrial production personnel, we should have a dispensary to accommodate 50. Consequently, we would not have been able to construct the kind we managed to put into operation as a result of the centralized fund of the association for social, cultural and domestic purposes. Both our workers and workers from other plants of the association rest in our sanatorium-dispensary.

When our plant was reconstructed, some of the capacities were expanded. We had to gather together a certain number of workers. The association allotted money from the fund for social, cultural and domestic measures for constructing five houses and a dormitory for small families.

The economic mechanism for management of ZIL, in my opinion, is distinguished by its good structure, its logic and its consistency. Double accounting has

been completely eliminated. Whatever comes from the branches for cooperation in the association is not taken into account in the volumes. This is internal circulation. The association's report on gross output and sales from the branch includes products going outside (for example, spare parts) and services. The provisions concerning intraproduction cost accounting rely basically on normatives of expenditures and not on average weighted indicators. This forces us to keep track of all kinds of expenditures. Although there are a considerable number of reporting forms, they are well thought out and from them it is possible to quickly analyze the condition of the enterprise's economy and promptly influence deviations from the plan and normatives.

During the period of reconstruction and technical reequipment it is necessary to devote special attention to the value of capital, for otherwise it is possible to put all of the savings back into the enterprise. Also, plants that manufacture equipment frequently increase the prices of it without justification. Sometimes it is necessary to refuse to sign technical and economic calculations when coordinating prices for new equipment. Thus the Vitebsk Machine Tool Building Plant offered us two kinds of machine tools which were almost twice as expensive and occupied 2.5 times more production space than the equipment they replaced but would provide only a 30 percent increase in productivity as compared to the former ones. We began to analyze the guidelines used by the machine tool builders when determining their price and it turned out that the main thing was the increased material-intensiveness and labor-intensiveness of the manufacture of the machine tools. But what good does this do the consumer? It will only cause a decline in output-capital ratio, which could lead to a deterioration of the economic results.

The calculation of the material incentive fund in the association is directly related to the results of production and economic activity, based on the provisions concerning cost accounting. Cost accounting commissions are clearly in effect when the results for the report period are summed up. But the system of sanctions, in my opinion, is developed better for the shops and productions within each enterprise than it is for interrelations among production units. Therefore it sometimes turns out that the system is very one-sided. If the branch does not fulfill some positions for deliveries to the main conveyor, sanctions are immediately applied to it. But we cannot submit complaints against the head plant if it fails to provide us with something under cooperation. If we make complaints through cost accounting procedures, our relations are spoiled. It seems to me that further improvement of intraproduction cost accounting should proceed along the path of improving cost accounting relations among production units. It is impossible to approach branches as facilities of specialized productions of the head plant.

[Question] How else besides through reconstruction and reequipment is the scientific and technical influence of ZIL manifested?

[Answer] It is fairly multifaceted and multiplanar. The majority of design and technological work for preparing the production of assembly units for the output of the new diesel trucks was done by technical services of the PO. I have always attached a great deal of significance to technical preparation of production. In 1972 this problem was the subject of my dissertation when I

was working toward the degree of candidate of technical sciences. The preparation of production largely determines the success of the assimilation of the new product. The help from the ZIL during the fairly difficult and tense period of reconstruction and technical reequipment made it easier for us to reorient production for the output of assembly units for diesel trucks.

[Question] How do you provide yourself with personnel and how do you train them?

[Answer] The plant has complete independence in hiring and firing workers, engineering and technical personnel, and employees. Since the plant has regularly fulfilled the plan for deliveries and has had no complaints for 6 years, the workers regularly receive bonuses and there is a correct ratio between the wages of workers and those of engineering and technical personnel. Our turnover of engineering and technical personnel is no more than 1 percent. The ones who end up at the plant through random distribution are the ones who leave. Since these personnel do not stay, we almost never use this source for augmenting our engineering and technical personnel. Once we tried sending workers for training at the ZIL Plant-VIUZ, but we saw that this is not altogether good. Many of them stay in Moscow. Then we took a different tack. In our own plant we have organized a training and consultation point (UKP) of the All-Union Correspondence Polytechnical Institute. We take 120 people each year. The students are mainly our workers who already have secondary technical education. They have made themselves a part of the plant and the nature of the work suits them. I think that the training and consultation point will continue to be our main source of finding new specialists. In 1986 we graduated the first engineers of our own.

The UKP will play a large role on the social plane as well. The direct path for advancement of skilled personnel from worker positions to engineering positions is through their UKP, especially for young workers; for almost all of them have a secondary education. Satisfaction of social and domestic needs and improvement of working conditions that are related to technical reequipment and reconstruction also contribute to retaining personnel.

We plan the number of industrial production personnel for ourselves. The only labor indicator the association establishes for us is the normative for wages. This makes us work on inventorying and certifying work positions, eliminate superfluous work positions, and increase labor productivity, and the savings on the wage fund go to pay for expanding the service zone. Not everything in the policy for organization and payment for labor suits us, however.

[Question] What does not suit you? In your opinion, which changes should be made?

[Answer] We have no complaints either about the wages or the material incentive fund. But it seems to me that it would be expedient to introduce equal conditions for bonuses for all plants. Each branch has its own specific features, problems and difficulties. Therefore it would be better if the provisions concerning bonuses were formulated at the enterprises. It goes without saying that this would be on the basis of fund-forming indicators that envision the provisions concerning intrafirm cost accounting at ZIL. We

ourselves should develop the conditions for material incentives which would help us to solve the problems arising at the given moment.

[Question] In other words, it is necessary to expand independence?

[Answer] Yes, this is precisely the situation. Problems of increasing initiative and responsibility are most closely linked to expanding the rights of the enterprise. The economic experiments being conducted in our country are directed toward increasing responsibility and independence. I think that it is also necessary to consider from these positions the rights of enterprises that are included in associations as production units.

Nor does it seem to me altogether correct that at ZIL the planning of labor indicators is done at three levels: the labor of workers--in the technological administration, engineering and technical personnel--in the administration for organization of labor and wages, and general planning of labor indicators--in the planning and economics administration. It should be concentrated in a single subdivision.

[Question] How are interrelations formed with territorial management agencies?

[Answer] This aspect of the interactions has turned out to be extremely complicated for many branches of the association. The fact is that we do not make deductions for the city and we do not influence its budget. But our collective, like any production or nonproduction collective, is linked to the city in which it works by strong social ties. The satisfaction of many social and cultural-domestic needs for public health, education, trade, utilities and so forth depend on the city.

Contradictions also arise in the interrelations with territorial trade union agencies. The oblast committee of the trade union of machine building workers and the oblast trade union council tell us that we must obtain passes for sanitoriums and health resorts not in Smolensk but at ZIL.

[Question] What are your suggestions? What, in your opinion, needs to be done to solve these problems?

[Answer] We need standard documents concerning the interaction between enterprises included in the association, on the one hand, and the rayon, city and oblast, on the other, concerning the solutions to social problems. I had the honor of being a delegate to the 27th Party Congress. The need for an optimal combination of branch and territorial administration of the economy which the Congress pointed out presupposes also a search for a better approach to the development of branches and enterprises that are included in large production associations. This task seems very crucial.

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## ZIL ECONOMICS SCHOOL EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 43-59

[Article by Ye. Lysaya and L. Shcherbakova: "On Cost Accounting Scales"]

[Text] At this hour the large elevators in the high administrative and engineering facility at ZIL stopped most frequently on the 11th floor. It was hard to believe that everyone who came up here could fit into the small office of the deputy director for economics. But this was a deceptive impression. The office turned out to be much larger than it had seemed on previous visits, and the ritual of meetings with cost accounting commissions did not require an immense amount of space.

The activity got under way rapidly and dynamically. The managers of facilities, shops and branch plants entered in turn, and, as a rule, the ones who were called in were those managers who were not up to date, and members of the commission had once again to weigh all the "pros" and "cons" in order to make a final evaluation of the results of cost accounting activity. We were given the opportunity to observe the economic kitchen of cost accounting. Those gathered in the office of the deputy general director for economics established a direct link between how the collective was operating and what it should receive. It is no wonder that the chief of the shop for gray cast iron was pressing the chief of the Administration for Labor and Wages, Vladimir Ivanovich Korneyev: "What do they intend to blame me for? I do not feel guilty of anything." Korneyev clarified: "Not blame, but discuss."

As it later turned out, there was reason for discussion even though the basic cost accounting indicators--deliveries, labor productivity, and production cost--looked very good. Lying on the cost accounting scales were above-normative residuals of material values, and the error on the scale, which was set at the indicator of the full amount of the bonus, began to move in the direction of reduction.

Above-normative residuals of material values, circulating capital, incomplete production and prepared products at ZIL comprise one of the basic conditions for making adjustments when evaluating the cost accounting activity of the subdivisions. At the same time, there are supplies and there are supplies, and the reasons for them differ. If they are approached head on, those people

who because of some circumstances have happened to exceed the normative and those who are not concerned about economy at all end up in the same position. Therefore, having had enough discussion of this at their meeting, the commission instructed the administration for labor and wages to develop a scale of bonuses, depending on the degree to which the supplies exceeded the normative. But according to the previous provisions concerning bonuses, with above-normative residuals the subdivision immediately forfeited 20 percent of its bonus.

This is the paradox that seemed to exist: the economic mechanism of ZIL was clearly oriented toward controlling expenditures according to the normative and not toward fixing them in terms of actual results, which is enough to satisfy many economic services of the enterprise. Nonetheless at each meeting of the cost accounting commission, "above-normative" is encountered more frequently than other violations. This contradiction clearly manifests those collisions that frequently occur in production: ZIL does not work for itself, it is linked by thousands of visible and invisible threads to a multitude of collectives of enterprises and associations. Until they eliminate the imbalance and the nonobligatory nature of relations with partners and associates, the association's cost accounting mechanism will have troubles.

"We did not accept nickel just for a supply, but nickel as a material that is hard to turn down," the chief of the shop for gray cast iron, whom we already know, said in his own behalf. "We do not keep large residuals. But I must admit that for certain positions we deliberately create above-normative supplies so that we do not have to depend on the suppliers," Valeriy Surenovich Avanyan, the chief of the administration for cooperative deliveries and batching, explained in the cost-accounting commission, "we have taken into consideration that the amount of our bonus will be reduced by a certain percentage. But that is better than a reprimand in an order or an interruption in production."

In the motor facility, one of the largest at the head plant, there were the largest reserves of incomplete production. "It did amount to 3.5 million rubles and later 5 million," informs the head bookkeeper of the association, Vladislav Ivanovich Sidorov. Formally, it is necessary to apply the strictest sanctions against the subdivision, but actually it turns out that at this point there is little it can do. The sharp increase in incomplete production is related to the lack of piston rings. They have accumulated 25,000 incomplete piston units. They have already filled up all the free space and there is the danger that the units will begin to rust.

"Rust?"--the members of the commission asked in agitation. "We are saying this to exaggerate the situation," the shop workers admitted, "we are taking measures to prevent corrosion. We are greasing the parts. But how many more products can we let stay out there?" "You must go to the deputy minister," suggests the chairman of the commission. "We have already written, what is the point?" Responds somebody, "we are not the only ones, the Michurinsk Plant is not delivering rings to other plants either."

It is understandable why people throw up their hands in such a situation--the reasons for the deviations are all the same, like a broken record. What

effect can there be from normatives and cost accounting sanctions! It is probably these aspects that are manifested in the defensive reactions in the form of indifference and complacency: the meetings of the commission have been conducted, the deviations have been registered, the actual amount of the bonus has been determined, and let everything else go as it will....

It is not easy for them to gather their forces and fight among themselves every time, but all they have to do is miss once or twice and everything rolls along the smooth road of formalism. Therefore the chairman insisted in his proposal to send the Ministry of the Automotive Industry a letter and report on the response at the next meeting. Many supported him. Jumping forward, let us say that the expected result was never achieved. Thus ZIL turned to a tested method—direct contact with the suppliers. A group of specialists from the automotive plant went to Michurinsk. The future will show if these measures were enough. It is important for them not to be reconciled and not to stop.

We have communicated previously with workers of the economic service and managers of technical subdivisions and shops. But then it was separately, with each individual on his own territory, where the manager, concerned about the mass of business and problems waiting for him, usually tried to answer all of the questions in a hurry in order to get back to his work. But now we have become spectators and listeners of dynamic dialogue among people who have contemplated, argued, and become bitter, completely involved in the essence of the problem.

The meeting of cost accounting commissions is certainly not a new phenomenon. It is assumed that without them it would be impossible to evaluate the activity of the subdivision during the report period. But there are still so many enterprises where these are conducted without vigor, formally, only for the sake of protocol, on the basis of which they are then supposed to issue an order concerning bonuses. There have already been so many cases when the commissions have not met at all, when after the fact their members have signed a protocol drawn up in the division of labor and wages on the basis of report data and incentive provisions!

At ZIL the meetings of the commission are an important element of economic management. When they are gathered altogether the managers can use cost accounting scales to weigh the pluses and minuses of the work of the subdivision for more than merely to determine the amounts of incentives and sanctions. Here they reveal disproportions, contradictions and uncoordinated aspects which arise and can either be resolved or measures can be taken to resolve them since the commission includes managers of all the leading services of the association. This is why the meetings begin with a verification of the fulfillment of measures included in the preceding minutes and not a single problem goes unattended.

This meeting was not an exception, either. But we were drawn into the story involving the gray cast iron shop and therefore in our narration we have deviated somewhat from the sequence of events. But in fact, as always, the meeting began with information about the result of the implementation of preceding decisions.

The cost accounting commission is of great educational significance and it forces the management of the subdivisions to delve more deeply into economics. A chief of a facility or shop will not go to the meeting unprepared, for if he did he would be sitting with an economist or bookkeeper of his subdivision and going into figures which, perhaps, he had not looked at during the entire report. But before being invited to the commission he absolutely must look at everything—he understands that it is not the economist or bookkeeper who will bear the main burden, although all three are invited to the meeting.

The heating shop had to forfeit some of its bonus for quality. Why? The deputy shop chief, Dmitriy Samsonovich Kruzhakov, tried not to agree with the commission's decision: "We have no defective work or complaints." The chief of the product quality administration, Leonid Petrovich Kuverin, confirmed that the only complaint made against the plant were for intraplant certification of parts. There were no other remarks about quality. But since the shop had more than once violated the time periods for certification, this had to be reflected in the amount of the bonus at some time. A decision was made to reduce the shop's bonus fund by 5 percent.

It seems that 5 percent is not a very large amount. But the association's commission determines the amount of the bonus for each production unit—branch plant, facility or independent shop of the head plant as a whole.

Subsequently the cost accounting commissions of these production subdivisions meet and concretely consider the individual contribution of each brigade, section and worker. And for those who have allowed violations, this 5 percent can turn out to be a much larger amount.

Incidentally, there are also cases in which the cost-accounting commission of the association takes on the mission of punishing specific individuals. A large part of this takes place when it comes to managers. The head engineer of the Zhitomir Plant had his bonus amount reduced by 50 percent for repeated failure to fulfill the order concerning certification of work positions.

Deliveries, quality, above-normative supplies of circulating capital and commodity-material values, certification of work positions and streamlining of production on the basis of this--these are adjustment and additional indicators which the commission also considers very carefully. Carefully, but not by the letter but by the spirit of the established provisions. The ministry can withhold the bonuses for the general directors for failure to deliver goods even if this is not the fault of the ZIL workers, but of the Michurinsk Plant for Automotive Parts which has not delivered all the piston rings and made it impossible for the automotive plant workers to complete their products. But the commission will not punish its own production subdivisions if they are not at fault. Flexibility and a differentiated approach require that the economic subdivisions of the enterprise always be in "creative form" and search for and find new solutions because life is much more complicated than the most detailed instructions and provisions, which, it would seem, envision all cases. And if they do not display realism, maneuverability and courage, if they want to take the risk they can become captive of numerous provisions and instructions.

In 1986 the ZIL workers entered into new conditions for management. But one of the major requirements of the large-scale experiment--100 percent fulfillment of deliveries and orders under agreement--had been adopted by them earlier, on their own initiative, among subdivisions of the association. The indicator of fulfillment of deliveries had long been among the basic indicators of intraproduction cost accounting. And it was tested in practice new ideas and variants of decisions appeared.

"It is generally known that if one sets an unattainable task nobody will be zealous in carrying it out," said Vladimir Ivanovich Korneyev. "We have become convinced that for certain of our subdivisions 100 percent fulfillment of deliveries is such an unrealistic task at the given moment. The facility for normals provides 10,000 kinds of items to other subdivisions under cooperation. It is impossible to demand of it that each month everything proceed ideally. Certain of our branches--Ryazan, Roslavl, Mtsensk and Serdobsk--are also not yet ready for complete fulfillment of contractual commitments. To bargain and come to agreements with the consumers concerning postponing deadlines and to make other similar decisions, as many enterprises are now doing, are not at all necessary for the association when it comes to internal cooperation. Therefore for internal cooperation we establish an upper level of deliveries which comes as close as possible to 100 percent--99.8 or 99.6 percent. This makes it possible for the subdivisions to obtain the full amount of the bonus. Then they have incentives to mobilize their capabilities and to reach for the limit. But for shops with the final product--assembly shops--fulfillment of external deliveries by 100 percent is an indispensable condition.

The meeting of the cost accounting commission is preceded by consideration of mutual cost accounting complaints of the subdivisions and nonproductive expenditures. To do this a special commission has been formed in which all the basic functional subdivisions, the people's control committee of the head plant and the trade union committee are represented. Various subjects come up at the meetings. One subdivision has made a cost-accounting complaint against another, say, for delaying deliveries of parts or for defective work. If the responding subdivision agrees with the complaints, it announces that it has accepted them and then it is charged for the sum for the cost accounting complaint. But if it protests, then the commission will engage in consideration of it. The confirmation of the sum of losses under the cost accounting complaint is the basis for reducing the bonus.

Many subjects are brought up at the meeting under a planned policy. The most crucial problems at the given moment are brought up for consideration: payment of fines for too much idle time of railroad cars, delay in the return of containers, failure to fulfill contractual commitments, increased defective work....

"Previously ZIL frequently paid fines for shortages in deliveries of scrap metal and for poor sorting of it," said the deputy chairman of the commission for complaints, the chief of the economics laboratory, Petr Naumovich Gokhman. "Having discussed this question at our meeting, we came to the conclusion that it is necessary to revise the indicators for evaluating the activity of the

shop for processing scrap metal and draw its attention to high-quality release of metal wastes--packaging, the formation of briquets, and sorting nonferrous metals. What came of this you can see today at the meeting of the cost accounting commission. The shop has received 200,000 rubles in excess of the plan for high-quality release, and 100,000 rubles for release of wastes of nonferrous metals at increased prices. But Vtorzhermet did not pay for preparing the scrap metal for export. The shop chief went to the arbitration board and obtained the sum the shop had coming."

The fines paid and the fines received by the association are also a subject of constant attention. The ratios between them are 4:1, 5:1 in favor of ZIL, but nonetheless every 1,000 rubles in fines is a subject of special consideration.

In business law there are still many unclear points and provisions that have not yet been refined, and it is quite predictable that their shortcomings are discussed in the press and at conferences. But are we taking advantage of all the legal norms that are established in the law? ZIL workers think that they are not taking advantage of them sufficiently. But how can one make them manage more intelligently? This is especially important for services which are always entering into external relations--supply, sales, cooperation. Their indifference or complicity in the violation of commitments by others has had a reverse side--they have not been charged with their own shortcomings. Therefore when the association's material and technical supply services changed over to cost accounting, one of the basic evaluation indicators was improvement of the work with fines. The results turned out to be very impressive. The sum of fines obtained from negligent contracting parties increased severalfold. To be sure, the first cost accounting provisions were imperfect--the proportion of the indicator of the sum of fines received turned out to be so significant in the evaluation of the cost accounting activity of the supply workers that it made it possible for them to obtain a bonus even when the other indicators lagged behind. The provisions were adjusted and improved, but the level of work with the suppliers and contracting agencies remained high as before and was sufficiently supported by the new provisions.

Cost accounting at ZIL envisions responsibility that is clearly regulated and established by particular documents. Free interpretation of these is categorically prohibited so as not to undermine the authority of the existing economic mechanism. And if this happens anyway, the cost accounting commission takes a principled position. The administration for the protection of labor has prepared a draft of an order for reducing the amount of the bonus for the heating shop by 25 percent as a result of increased cases of illness. The shop is appealing to the commission, protesting the document that is being prepared.

Buzhinskiy: "How did this document appear?" Korneyev: "It was prepared in the administration for the protection of labor since the indicator of illness was introduced." Buzhinskiy: "That is not the way it is done. Without the cost accounting commission and the economic service nobody has the right to change the bonus provisions. After all, at one time a comprehensive indicator of labor protection was introduced. If changes are needed in it, let the suggestions be made to the economic service at a meeting of the commission and warn the shops."

The spare parts service did not promptly coordinate the conditions for the delivery of cast pieces with the consumer enterprise, the Bryansk Machine Building Plant. The service tried to present the shop as being guilty of the complaints from the consumers. "Why the shop?" responded the commission. "The shop is the production organization. And the spare parts administration has lawyers. And it is necessary to punish the administration for the fact that its specialists have neglected their functions, have not started to straighten things out, and have evaded the essence of the matter. Because of their formal approach ZIL lost a considerable sum." It was suggested that they enter into the minutes: "The spare parts administration is to refine the conditions for the deliveries of cast pieces to the Bryansk Machine Building Plant. The measures taken are to be reported at the next meeting of the commission."

"In practice," says the chief of the planning and economics administration, Viktor Viktorovich Novikov, "there is frequently this separation: cost accounting--economists, norm setting--technologists, accounting--bookkeeping, new technical equipment--design services. But yet production is a unified organism. Nobody should replace anybody else, but it is also impossible to be separated by functional barriers and senses. Although everyone is responsible for his own part, together we are responsible for the common cause--the work of the association. Meetings of the cost accounting commission make it possible to see the communal responsibility and to think together about how to realize it. I see their large role in this."

Here is a view from the other side, the technical services, but it also confirms this viewpoint: "Economic and engineering activity cannot be separated," says the head technologist of the association, Leonid Alekseyevich Statin. "There is production and its problems which economists and technical people must consider together. In our association it has become the law to have economic development of any technical innovation. At first the engineering services were afraid that the economists would not support them. Then we became convinced that economists always approach from positions of production expediency, and we are not afraid of showing all of our cards to them, on the contrary, we go to them for advice before we draw up the official economic substantiation of the innovation. Even if some innovations related to improving the quality of the motor vehicles and increasing their reliability at first look as though they will cause a loss, the economists do not persecute us. This makes it possible to solve not local, but large state problems. For instance, today there are high prices for certain new materials, even if they are parts from metal powders or new bearing systems. If their application is not expanded production will not develop, technical progress will be delayed and the price will still remain high. ZIL will deliberately make the first expenditures if it sees the future. The supplier plants place their hopes in us. Sometimes when supporting them we go to the Gosplan and enter into shared participation. It seems to me that this approach is the strong side of the activity of our economic service."

All the "pros" and "cons" can be fully weighed on our cost accounting scales only when the responsibility for their actions and the possibility of carrying them out are also complete. The changeover to the new conditions bring us

closer to this," asserts Aleksandr Ivanovich Bruzhinskiy, "but only closer. It is necessary to take the path of self-financing of enterprises and associations, following in the footsteps of VAZ and the Sumy Association, which have already entered on this path."

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## RESULTS OF EXPERIENCE IN KUZNITSA REPORTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 46-51

[Article by Ya. G. Gorodskiy, candidate of economic sciences, Minsk Branch of the Scientific Research Institute of Management of the Automotive Industry: "The Kuznitsa Experience"]

[Text] At the present time, when the center of gravity for improving the economic mechanism has shifted to intraplant cost accounting, advanced experience in its development accumulated at the Automotive Plant imeni I. A. Likhachev is of great interest. From the time of the creation of this flagship of domestic automotive construction a task was set of more complete utilization of production resources and mobilization of reserves for fulfillment of the tasks that were set. Even then cost accounting was recognized as the best organizational form. It is interesting that it originated in a working environment. The first cost accounting brigade was organized at the Moscow Automotive Plant in 1930, and by the end of 1932, the final year of the 1st Five-Year Plan, there were 420 cost accounting brigades at the plant. The brigade and the administration concluded agreements which reflected the commitments of the brigade for fulfilling the production program, reducing material expenditures, reducing defective work, and commitments of the administration for providing materials, transportation and so forth. The collectives of the brigades that provide for savings on material resources were given incentives in an amount of 6 percent of the value of the resources saved by the brigade.

Under modern conditions cost accounting has "grown up" quite a bit and is arranged taking into account two principal peculiarities. In the first place, the basic form has become cost accounting of production units that are operating on the basis of the "Provisions Concerning the Plant of the ZIL Production Association" within the framework of the rights granted to them by the Production Association. The unified technical and economic policy is ensured by the Board of General Directors of the Association which, when engaging centrally in interrelations with external organizations (banks and so forth) at the same time has given the production units current and subsidiary special loan accounts instead of the usual current accounts.

Second, when planning and accounting for the output of products of the association, internal circulation is not taken into account. This approach directs all production units included in the association toward the final national economic result.

The organization of the planning of cost accounting activity of the subdivisions in the association is interesting. We are speaking about the formation of the declared plan, when the subdivision makes an economically substantiated decision which is used as a basis for the planning assignment. Here it searches for reserves and brings them into production.

Methodological support is very helpful in organizing an effective system of intrabusiness cost accounting. Suffice it to note that the very "provisions concerning cost accounting of production units" are provided with 33 sets of instruction and methodological materials for various questions of organizing cost accounting. Among them are the "Provisions Concerning the Cost Accounting Commission of the ZIL Association," "Instructions Concerning the Policy for Accounting and Reporting on the Fulfillment of the Plan for the List of Products by Plants of the Association, Facilities, Shops and Supply Administrations of the Head Plant," "Instructions Concerning the Policy for Determining the Results of the Expenditure of the Wage Fund and the Ratio Between the Growth Rates of Labor Productivity and the Average Monthly Wages in the Various Subdivisions of the Head Plants and Plants of the Association," and so forth.

Cost accounting for functional services is developing. First of all there is a stronger cost accounting influence on reducing the time periods for preparing production of new items of automotive equipment, improvement of the quality and the ability of the items to compete, and insurance of savings on all kinds of resources. Each month there is a comprehensive evaluation of the results of the work of engineering and technical personnel and employees of all subdivisions (production units, facilities and shops) for improving the quality of the products that are produced according to seven indicators (losses from defects, number of complaints about defects, repair of motor vehicles in the group of eliminating defects, and so forth).

ZIL has introduced a normative policy for forming the wage funds for the various subdivisions of the association. It is constructed from two parts: the base fund and the sum of its increases (reductions), calculated according to a normative for each percentage of increase (reduction) of the volume of production in terms of the indicator used for calculating labor productivity. With this approach there predictably arise differentiated normatives for each subdivision of the association. The accepted method stipulates that when calculating the basic wage fund one subtracts 50 percent of the sum paid for deviations (payment for idle time is calculated in the full volume as are additional payments for overtime). The overall planned wage fund is determined as the sum of the wage fund for industrial production personnel calculated according to the normative for the wage fund of nonindustrial businesses and the supernumerary staff.

The ZIL approach to forming and utilizing the material incentive fund is interesting.

A policy has been established for changing the amount of the material incentive fund as a result of the appearance of expenditures to correct defects for which there have been complaints from the consumers of the products. Each subdivision is centrally issued a unified material incentive fund which is intended for bonuses: for creation, assimilation and introduction of new technical equipment; for manufacture and delivery of products for export; for the results of intra-association competition and so forth.

The automotive plant's experience in developing cost accounting relations and increasing their role in economic administration is multifaceted. A number of their interesting solutions in the area of improving intraplant cost accounting have been reflected in the standard branch documents and are being introduced extensively into the practice of management. This is probably where the high evaluation of the association's advanced experience is reflected.

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## FUTURE TAKEN INTO ACCOUNT AT ZIL

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 51-58

[Article by G. V. Grenbek, candidate of economic sciences, "Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Direction Toward Tomorrow"]

[Text] The ZIL is a complex association, as one can see from the materials in the selection, which includes enterprises that were previously in various subbranches of the Ministry of the Automotive Industry.

Why has the ministry decided to create such large complex associations? Because branch planning, production-distribution and other administrations were not able to provide for stable operation even of such large enterprises as ZIL, VAZ, KANAZ and GAZ. In the materials of the selection, especially the conversation with the general director, one can see this aspect of the matter. The ministry, as a rule, is not in a position to manage its own small enterprises which are to deliver batching items to the automotive plants. Therefore ZIL, on the one hand, was forced to include these enterprises in the association. On the other hand, after this organizational measure it was necessary to spend its own money on the development of these plants in order to bring them up to the necessary level. All other large associations were forced to do the same thing. And it could be no other way under conditions in which production is not subordinate to the consumer, when batching becomes a problem for the enterprises.

In this connection there is a predictable question: If ZIL had not been forced to engage in bringing up the rear with its own funds and forces, would the branch enterprises have had enough forces, money and engineering initiative to solve the problems of their own technical development? Probably not. The ministry would have had to take responsibility for the technical policy for the development of its own enterprises which produce batching items in proportion to the development of the branch. The ministries do not deal with this sufficiently. They mainly distribute the funds which the branch receives for technical development, and ZIL takes responsibility for predicting technical development and sees how these funds are used in the decisive areas, that is, it performs part of the functions of branch management but, naturally, on the scale of its own needs.

In the materials of the selection one can trace one more line of this aspect of the matter: when one association or another achieves something for its own goals the branch can utilize the result for the benefit of other enterprises, for which it has not provided as much in the hope that this would be done by the large collectives. This is how it happens that ZIL, for example, had to construct a new casting plant for its own needs, whose capacities will be used for producing blank pieces for other associations as well.

With correct expanded reproduction on the basis of technical development there should be no one-time tasks for radical reconstruction of large enterprises. But today the reconstruction of many of our largest enterprises, in terms of expenditures, is comparable to the construction of new ones, and, in terms of difficulty, frequently surpasses it. The reconstruction of ZIL was envisioned by party documents. It was impossible to explain and justify this simply by the changeover to a new class of vehicles. Of course, ZIL is beginning to produce an improved motor vehicle with a diesel engine, but there are no principal differences in the technology for manufacturing the machines. Consequently, it was a matter of technical reconstruction of an enterprise, which will make it possible to raise the head plant to a new technical level. Reconstruction is only intended for changing over to new machines. With normal technical predictions in the branch this work should go on from year to year.

The path selected by ZIL at the present moment is the only realistic path for the development of production capacities which it needs. The economic mechanism does not allow it any other path, such as combining branch plants on its own books. Thus the complex production association is an inherent need of the present day, especially in machine building, where there is a very high level of batching, both in terms of the proportion in the production cost of the products and in terms of the significance in the technical specifications of the items. ZIL is a prototype here. It demonstrates the possible forms of changing over to production complexes. But the association's geography is hardly justified. The transportation constituent has too much significance. ZIL should have its own authority and funds so as to economically conduct shipments over 6,000 versts (to the Chita Branch).!

The position occupied by the general director seems very important to me. He evaluates the branches not according to what they are now, but what they will be in 10 years, since their managers are concerned about maintaining the technical and technological basis of production from which they "extract" both labor productivity and profit. This direction into tomorrow is typical also of the economic work at ZIL, which is arranged on a very healthy basis of orientation toward a specific motor vehicle.

Expansion of the rights and independence of the enterprises in keeping with the measures being taken in the country makes it necessary to note another aspect which draws attention to itself in the materials of the selection. It is typical that all authors are unanimous about the need to give them greater independence than what they now have. This comes through both in the conversation with the general director and in the articles by V. V. Novikov and V. I. Sidorov. But the same thing is said by the director of the Smolensk

branch regarding the management of the association. Of course frequently the limitations placed on ranches is associated with their lack of preparedness to take the solution to problems into their own hands. But in many cases there is a tradition of management of industrial enterprises which has taken form over decades. If there are instructions for bonuses that are mandatory for the head plant, they must also be extended also to the branches and reinforced in internal documents.

Yet, from our point of view, even within a single association which has all the same kind products one cannot utilize the same devices for management influence or the same method of incentives with equal effectiveness. Materials from the selection emphasize the need for freedom in economic and managerial maneuvering.

The idea that it is impossible to make any decision (even a design or technological one) without a sensible economic interpretation of current management results and those of the distant future is absolutely true, and any executive should take advantage of it. And, consequently, in any large subdivision there should be an economic unit--one individual or division, depending on the size of the subdivision and the tasks facing it. I agree with A. I. Buzhinskiy that these people should work under the direct guidance of the chief of their subdivision. They comprise his apparatus and his staff. The staff for economic evaluation of decisions that are made. But in order to make intelligent decisions it is necessary to know what the association as a whole is doing in economics and it is necessary to be methodologically associated with the entire economic service. This is the case at ZIL. To be sure, it is not very clear how many economic decisions are made "from below" and are "attached" to the final goals of the association. For example, a subdivision may wish to reduce the production cost of its assembly unit. Would this be useful for the association? For the national economy? Perhaps it is better to increase it but in such a way that the national economy would gain from increasing the maximum amount of mileage or other indicators of the motor vehicle. This problem of combining the interests of the association and the national economy must be resolved at ZIL as well as at other enterprises. At ZIL there is the hope of resolving it. While providing unified methodological guidance of economic units in the production subdivisions and the technical services, the head economists provide goal direction for this work.

V. I. Sidorov raises problems of bookkeeping in an interesting way in his article. I should like to note that the normative system for bookkeeping, which is a necessity today, will produce no return unless the sphere of its application is limited to direct expenditures. At ZIL they are trying to embody the idea of normative accounting in all aspects of economic life, and a good deal has been achieved here with respect to accounting for direct expenditures. The future can also be seen: efficient registration of causes of deviation and their analysis. This is very important, since today many people take advantage of selective analysis--wherever there is trouble. The second task facing the bookkeeping service is to expand the range of normatives and to account for expenditures with the help of computers.

The experience in economic work presented in this selection is a useful school for organizing economic activity at an enterprise, taking the specific features of one production or another into account, naturally.

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## ROUND TABLE DISCUSSION HELD ON CONSULTING

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 60-91

[Round table discussion recorded by Ye. Leonidova: "How Should Consulting Develop?"]

[Text] The program for accelerating the country's socioeconomic development, which was earmarked by the 27th CPSU Congress, places great requirements on each enterprise and association. They need significant assistance in organizing the restructuring of production on the intensive path of development. Management consulting can be an effective form of this.

A good deal has been said and written about management consulting in recent years but it has not become significantly widespread yet, even though the EKO mail shows a considerable interest in its problems. Therefore the editorial staff has decided to gather at the "round table" scholars, specialists in consulting, managers of enterprises and representatives of planning and management agencies in order to discuss the question of what needs to be done in order for management consulting to become a real force. The discussion was led by the editor in chief of EKO, Academician A. G. Aganbegyan.

Participating in the discussion were:

G. G. Abramishvili, Doctor of Economic Sciences, Professor, Moscow State Institute of International Relations;

E. P. Dzhugeli, Doctor of Economic Sciences, Professor, Department Head of the Institute of Management of the National Economy, Tbilisi;

Ya. A. Leymann, Candidate of Economic Sciences, Director for Science of the Special Design Bureau of Systems and Methods of Management of the Estonian SSR (Ministry of Light Industry, Tallinn);

A. Ye. Luzin, Candidate of Economic Sciences, Senior Scientific Association at Moscow State University;

N. Ya. Makarov, Candidate of Economic Sciences, Moscow;

S. T. Pachin, Chief of the Oblast Administration of Local Industry, Aktyubinsk;

I. I. Prokopenko, Candidate of Economic Sciences, Senior Scientific Associate of the Institute of Economics of the Academy of Sciences of the UkrSSR, Kiev;

N. A. Starov, Candidate of Economic Sciences, Department of Management Labor and Business of Moscow State Historical Archives Institute;

R. R. Suleymanov, Candidate of Economic Sciences, Deputy Chief of the Zonal Center for Scientific Organization of Labor of the Ministry of Civil Aviation, Novosibirsk;

Yu. I. Tychkov, Doctor of Economic Sciences, Member of the Editorial Board of the Magazine EKO;

M. Ya. Khabakuk, Doctor of Economic Sciences, Department Chief of the Institute for Increasing Qualifications Under the Estonian SSR Council of Ministers, Tallinn;

I. P. Shkurenko, General Director of the Aktyubrentgen Association, Aktyubinsk;

R. K. Yuksbyarav, Doctor of Economic Sciences, Department Head of the Polytechnical Institute, Tallinn;

G. A. Yavlinskiy, Deputy Chief of the Division for Improving Management of the USSR State Committee for Labor and Social Problems, Moscow.

We offer for your attention an abbreviated text of the discussion.

A. G. Aganbegyan: We wish to conduct a free, creative discussion of questions of management consulting, of course, in connection with crucial practical tasks for accelerating scientific and technical progress and all socioeconomic development. Consulting has not produced any effect yet because the organizations engaged in it have not been developed and their status has not been determined or legitimized. And also various meanings are included in the concept "management consulting."

In our round table discussion today we should like to clarify these issues. We must point out very clearly what effect can be produced by consulting, what organizations are needed and what their status should be. Of course, the most convincing thing would be an analysis of real experience. Even if formally there are no organizations which could be officially called management consulting organizations, there are various scientific research institutes, higher educational institutions and special design bureaus which do management consulting. We know that some of you have provided consulting and others have

asked consultants to your enterprises and worked together. We should like to rely on this experience. This will be convincing and interesting. It is necessary to analyze the practical steps and draw practical conclusions from them.

#### How To Interest and How To Help People?

I. P. Shkurenko: I decided to be the first to speak because the Aktyubrentgen Association has a certain amount of experience in interacting with consultants, although this was our first experience and it was probably rough: the brigade of EKO experts was just feeling about for possible principles of cooperation between consultants and production workers.

Allow me to express my deep conviction that management consulting is absolutely necessary. This is illustrated by the practice of any enterprise. As a rule, technical problems are diagnosed fairly quickly, whether they be imperfection of designs breakdowns in technology or poor quality. Diagnosing problems in management is considerably more difficult. One's view of one's own problems is always clouded, and it is difficult to evaluate one's own level of management. This is why it is necessary to take a fresh look from the outside, even if this opinion is not always pleasant to the manager's feelings about himself, and even if he does not always agree with the conclusions and does not accept and act on all of the suggestions. But there is food for thought, and subsequently the existing experience in management and problems that are waiting to be solved will do their own work. He will utilize the best advice.

The ideal variant of consulting is comprehensive research. This is precontractual investigation of the enterprise in various areas, preferably all of them. Then comes the development hypotheses about weak spots. It seems to me that during the course of a brief survey it is impossible to really reveal the "bottlenecks."

We have a certain amount of experience in comprehensive work with the Alma-Ata Polytechnical Institute. The brigade is headed by the chief of the faculty of economics and organization of industrial production, and he has many graduate students. The brigade scrupulously digs into all of our problems and then generalizes its observations and gives suggestions. Then it again looks to see what has happened, thinks about it, and makes adjustments. The process turns out to be lengthy.

EKO: But is there an effect from this?

Answer: Undoubtedly!

Z. P. Dzhugeli: Still it is doubtful that consulting should last for years. Do you not agree?

I. P. Shkurenko: In my opinion, comprehensive investigation requires a long time, and then it takes a long time to carry out the suggestions.

G. A. Yavlinskiy: How do you evaluate the responsibility of the consultants to the enterprise? The expert has consulted, he has been paid and it has turned out that he has made a mistake and instead of good he has caused harm?

I. P. Shkurenko: Unfortunately or not unfortunately, up to this point the consulting activity in our association has been conducted not on a monetary basis, but under agreements for cooperation. I think that this is incorrect. But so far there are no professional consultants. Only when management consulting is placed on a cost-accounting basis will it be possible to speak about complete responsibility. Of course one must pay according to the result.

G. A. Yavlinskiy: Well, anyway--what if the result is negative?

I. P. Shkurenko: It will probably be possible to avoid this.

EKO: The consultant only gives recommendations. He does not have any power. The suggestions are carried out by the enterprises and they have the right to accept or not to accept the suggestions.

A. Ye. Luzin: The main role of consultants is to help in the introduction of certain management innovations. The consultant is a person who takes a suit that is basted with white threads on a mannequin and, figuratively speaking, tailors it to fit the client. But it does not take years! The advantage of the consultant is that in a year he works for dozens of enterprises, perhaps 30-50. Naturally, while giving something to each one, he also gains knowledge. He is like a bee that flies from flower to flower, gathers nectar and then produces excellent honey. His role is precisely that of transferring experience, having the ability to alter standard developments to fit the conditions of a given enterprise.

The uniqueness of the consultants' service is that each consultant accumulates a supply of solutions to the most typical problems that have been tested in practice and that he is capable of helping the management of the enterprise receiving the consulting in adapting a prepared solution to the specific features of the given situation.

The nature of the interactions between the consultant and the client can be described in the words of a proverb: "Two people sitting in the same boat will not poke a hole in it." When the plan for innovations is realized through joint efforts of the consultant and personnel of the organization, success is guaranteed.

S. T. Pachin: Dozens of organizations a year.... This approach makes me doubtful. True, it would seem that one could not simply set a deadline. Everything depends on the problems that are raised. Of course if a client formulates precisely a concrete request, the consultant can quickly conduct a diagnosis and tell the manager how he must act.

Let us take this problem. A manager has to counteract external factors, many external circumstances are exerting pressure on him and impeding his work. I do not wish to say that there are no ways of protecting him against these. But the opinion of a consultant would also be useful here.

It has been suggested that our oblast change the structure of local industry. I am not 100 percent convinced that this is correct. We have selected our direction and there was no one with whom to consult, at least not in our region.

N. A. Starov: Management consulting is an important function which is the binding link between scientific investigation of a problem, advanced experience in the area of streamlining management and existing practice. If the consultant is compared to a bee, then, developing the analogy, the consultation center at the VUZ, scientific research institute or institute for increasing qualifications is a kind of hive in which information about advanced methods and forms of management is collected and the bearers of this informational wealth.

The Moscow State Historical Archive Institute has created a consultation center for organization of management labor and business. Consultation services for industry are rendered by departments of the MGU imeni Lomonosov, the International Scientific Research Institute of Management Problems, the All-Union Scientific Research Institute of System Resarch, the Moscow Institute of Management imeni S. Ordzhonikidz, the "Tallinn" Polytechnical Institute, Interrepublic Institutes for increasing qualifications of the Estonian and Lithuanian SSR's, the PKB of management systems of the Estonian SSR Ministry of Light Industry, the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences, and other institutions.

A. Ye. Luzin: Yes, our country has accumulated a certain amount of experience in management consulting activity: Soviet consultants have worked for hundreds of enterprises both in this country and abroad; there are a number of specialists who have undergone training in training centers of the leading consulting firms of the world and have the necessary knowledge for training Soviet consultants; several monographs and dozens of articles on this subject have been published, and there are several consulting groups functioning. This activity has been developed especially in the Estonian SSR. But on the scale of the entire country it does not yet cover even one-100th of a percent of the real needs. And it is not, as certain scientists think, that in our country we simply do not use the term "management consulting," although there really is an Institute for Management Consultants in existence, particularly scientific and training institutions and centers for scientific organization of labor. Still, in the majority of cases their activity cannot be called consulting. Research conducted at the request of enterprises, as a rule, takes months and frequently even years, while similar work by foreign consultants is done in a couple of weeks. The cost of identical applied economic research in terms of the practical outcome is 2-5 times greater than the cost of the work done by consultants. Social and psychological problems having to do with introducing comprehensive innovations, which are especially important in this stage, fall completely outside the field of vision of existing institutes. Our directors have practically no possibilities of obtaining efficient, confidential consulting assistants from high-ranking professional specialists who have a good theoretical background and experience in solving similar problems in other organizations.

Yu. I. Tychkov: Since I have managed to play both roles--to work as a consultant at the Pavlodar Tractor Association and be the one receiving consulting--I have tried to think about consultant activity from both sides. From conversations with certain directors I have received the impression that they do not sense a real need for consultation. Moreover, if certain of them even try to make contact with experts, they have a certain amount of skepticism regarding the results of these contacts, which complicates the work of the consultant. The first thing a consultant or group of consultants should do when communicating with a client is convince him of the usefulness of the activity, and not with references to foreign experience, but using examples of actual useful activity in our country. There are not many of these examples but they do exist.

The second thing is also from my experience of playing both roles: the consultant must be extremely candid but, while being candid, he must be extremely tactful, and this is already an art of behavior. Sometimes one wishes to call things as they really are but it is necessary to think about the consequences and restrain oneself so as not to offend the client. Otherwise the whole job can be spoiled. It is good if the expert tries to find something positive in the organization, and in conversations with the top official he should begin with this, and then say--"But I could not help but not...." A conversation that is begun with a negative immediately evokes a reaction of resistance. And, after all, the client should win people over and gain their confidence. What, in my opinion, could be the classification in consultation activity? It seems to me that it is possible to single out three kinds of consultation. The first is methodological transportation. This is where at one time we began with our interaction with the sociologist, when we turned to him with questions regarding the organization of contract brigades. We thought that we knew how to solve the problem. But it turned out that we were methodologically unprepared.

Another kind of consultation assistance for the enterprise is drawing up a long-term strategy for development. This, in my opinion, is the most complicated kind of consulting, which requires the high qualifications of an expert who must also have practical experience behind him.

And the third kind is special-purpose consulting, when there is some problem that is more or less particular and advice is needed as to how to solve it.

If one proceeds from this classification it is possible to make various demands on the consultants and the methods of their work. In the first case, the methodologist consultant should be a theoretician. In the second case, it should be an expert with a very large amount of practical experience behind him. In the third case it should be a consultant who specializes in a particular problem.

A. Ye. Luzin: World experience shows that the sphere of the consultant's activity does not have clearly marked boundaries. It is now practically impossible to find a management problem which all consultants would take on. If one were to look at the activity of consultants through the prism of the basic roles they play, it would be especially possible to single out the three

main roles: the expert, the specialist in the process of change, and the diagnostician.

Traditionally the consultant has filled the role of an expert, that is, a specialist who claims to have profound knowledge of problems of organization and management. The work has amounted to conducting an analysis and submitting a report with a set of recommendations. But world practice shows that at least three-fourths of these recommendations are never introduced into practice. The reason is that there is not enough time to delve deeply into the existing problems and offer advice in a general form. In the majority of cases in our country scientists who render assistance to organizations in improving management are still guided by this model.

But there are still good ideas, even without consultants: the basic problem consists in realizing them. The consultant is a specialist in a process or, as he is frequently called, an "agent of change," and, suppressing his own desire to carry out only his own idea and use it as a basis for his recommendation, he must concentrate all his efforts on rendering assistance to the organization in mobilizing resources.

The third role is that of the consultant-diagnostician. In principle, any serious work should include diagnosis. Fairly frequently organizations enlist consultants to solve secondary problems and not basic ones. Conducting a diagnosis makes it possible to reveal the entire totality of problems and their interconnections and also to determine priorities.

#### On What Does the Demand for Consulting Depend?

R. R. Suleymanov: Does it not seem to you, Yuriy Igorevich, that certain managers are in no hurry to ask for management consulting for fear of losing their authority? And the second question: Are they not afraid that during consulting reserves will be revealed and the enterprise might suffer from this?

Yu. I. Tychkov: I think that such doubts exist. The managers understand that any consulting will reveal reserves and, of course, they are afraid that this will be made available not only to them, but also to others.

I. P. Skurenko: Why others? Is the consultant going to go to the ministry with this?

Yu. I. Tychkov: In all probability, no. The consultant's ethics do not allow him to report anywhere the information that has been given to him in confidence. But still the manager is afraid that production reserves will become public and this will cause certain complications.

R. K. Yuksvyarav: The code of the consultant stipulates that he must be able to be silent. The clients have their large and small secrets and the consultants must not expose them. In essence, this is also how they act. I am speaking on the basis of my own 20 years of experience in consulting. In our republic we have tried to create a code for the consultant, and now we are using it.

G. G. Abramishvili: It seems to me that the skeptical attitude on the part of certain managers toward consulting is caused by the lack of development of this practice. Management personnel do not have an idea of what they can gain.

I. I. Prokopenko: I think you are right. Unfortunately, up to this point I do more consulting activity abroad than in the Soviet Union. The demand for consulting is greater there than it is here.

Why are we not developing this kind of activity. I see the most significant reason in the lack of a need. Today the situation is changing favorably because of the expansion of the rights and responsibilities of the enterprises. For a long time the enterprises were generally not interested in consulting, and, moreover, they were not interested in new technical equipment, in utilizing reserves or in adopting difficult plans because the greater their achievements were, the more rapidly the planning assignments increased and the leading collectives ended up in the worst position. This is the first economic factor, that closed off the need for consulting. And since there was no demand, there was no practice in this activity.

During the 1960's consulting work began actively because of the economic reform. Certain enterprises decided to keep internal consultants. But then they came to the conclusion that it was costly and unnecessary to maintain a consultant at the enterprise.

I do not believe in internal consulting. If a group of experts is formed into a special subdivision, it soon ceases to be original, it is built into the existing structure, it fails to notice a good deal, and it enters into formal and informal communications (incidentally, this is taking place in the West as well and therefore they are looking for more consultants on the outside). But I believe in temporary target groups which are especially created at the enterprise for solving some particular management problem. Such groups can work successfully with consultants brought in from the outside.

A second serious problem. The director does not always have the possibility of acting on the suggestions of the consultants, for example, changing the structure or the staff. The director should coordinate this with the State Committee for Labor and Social Problems and with other organizations. He cannot depart from the wage fund, wage rates or salaries. He cannot even take minor recommendations from the consultant concerning the technology of management, planning and so forth. And yet the main thing is the general problems of improving the work of the collective, training and payment.

There is also the psychological aspect of this difficulty. It is impossible to conduct a diagnosis, especially when the consultant has to involve a large number of personnel, if he is not convinced that the director has the right and the possibility of following his recommendations. Imagine that a questionnaire is used for diagnosis. In the questionnaire they focus attention on certain shortcomings. People who fill out the questionnaire see that nothing is changing. This can have negative consequences.

I have had cases in which the suggestions were not utilized. In one scientific and technical complex where I was invited for consulting with the deputy director, having completed the stage of diagnosis I was convinced that the collective had practically no horizontal communications. In order to solve any problem the workers have to go up in the hierarchy right up to the deputy directors. The strategic goals of the organization were not clarified. We discovered that there was an inability to plan, organize and manage. Scientific workers used more than 40 percent of their time for work not in their specialty and were employed in jobs that could be done by any laboratory worker with a 10th-grade education. More than half of the managers had no specialized managerial education and had not undergone management retraining in institutes for increasing qualifications.

A comprehensive method was suggested for changing the organizational structure, the functional ties and the training of personnel. How was it to be realized? Problems of changing wages and structure are not completely within the framework of the capabilities of the director. They began consulting with the ministry. The trade union objected to differentiation of wages....

I. P. Shkurenko: You were speaking about minor rights from the standpoint of the structure, staff and wages. Perhaps you were dealing with an institute which was very strictly formalized? But in general nobody prohibits manipulation with respect to the structure.

I. I. Prokopenko: That is not quite true. This is a large scientific and technical complex. But it had no restrictions on staff or wages. Now, after the adoption of the decree concerning improving wages of workers of scientific research institutes, design bureaus and planning institutes, the rights have been expanded. And I think that managers of the complex will take advantage of a favorable situation in order to realize the ideas that have been proposed.

M. Ya. Khabakuk: I have been working in the area of consulting for more than 15 years. At first we did not have very many orders either. It was necessary to look for enterprises which would agree to take advantage of our suggestions. At the present time in Estonia the market for management consulting has increased so much that Estonian consultants can satisfy only one-third of the demand. And 90 percent of our clients are enterprises and associations while 10 percent are central agencies of the republic. In 99 out of 100 cases the managers themselves come to us with orders. Perhaps only 1 percent of the contacts arise when the consultant would be interested in obtaining an order from some organization and he himself offers his services to this organization.

As compared to the experience in consulting in Pavlodar in Aktyubinsk, which has been written about in EKO [footnote 1] the work is conducted more rapidly.

My practice has shown that 30 percent of the orders are of the classic type: the organizational structure, refinement of the division of labor, procedural analysis and so forth; 20 percent are strategy for the development of the organization; 10 percent are diagnosis, when a fresh person comes from outside

and takes a look; 10 percent are for training, and all the rest make up 30 percent.

Our neighbors across the gulf, the Finns, are developing 100 areas of consultation, and we can work in 20 areas. Our institute for increasing qualifications under the republic's Council of Ministers has approximately 50 orders a year. Almost all of them are minor ones and there are perhaps 3 or 4 large ones. The methods our consultants use are mainly these: interviews, analysis of documents, and observations. There is no great difference here--the same methods are used by managers when preparing to adopt any decision. But the fact is that when we conduct an interview we conduct observations at the same time. We are interested not only in what the manager says, but also in how he says it. Of course there are also special methods: questionnaires, "brainstorming" and so forth.

We are not advocating using any especially complicated methods with mathematical software which require a great deal of time. If it takes too long to examine a patient, either he gets well on his own or he dies. The situation changes rapidly.

N. A. Starov: Progressive managers are taking advantage of the assistance of management consultants. This is confirmed by the Estonian experience, the work of EKO brigades in Aktyubinsk and Pavlodar, as well as our observations.

When through the efforts of the dean of faculty of state business, Docent V. S. Mingalev and Prof L. V. Kotin, at the Moscow Historical Archives Institute a consultation center was created for organization of management labor and business, from the example of its work we were convinced of how great the need for consulting is. The informational letter we send out concerning the subject matter for consultation and the forms of the center's work in just one branch--the chemical industry--gave rise to an influx of hundreds of letters requesting that various services be rendered, beginning with courses at the center and ending with invitations to consultants to local areas, right down to Khabarovsk Kray.

EKO: Judging from our mail, there are many requests for consulting. But one must keep in mind that the demand also generates supply. And there are almost offers for consulting in the mail.

E. P. Dzhugeli: Imagine this picture: Five-6 years ago, in the center of Tbilisi they constructed several large buildings with the common sign "Consulting Firm," and even if they had advertised that the plan consults on economic problems--not a single manager would have gone there. I assure you. But in recent years the situation has become quite different. I can explain this by the fact that the level of economic thinking has risen. Economic experimentation is being conducted on a broad front. The managers now have incentives to go for consultation. We are feeling this every day. The people have begun to look at problems differently. The republic is preparing for the creation of a consultation organization.

Institutes for increasing qualifications, such centers as the one in the Siberian Branch of the USSR Academy of Sciences and such a closed system as in

Estonia can become the organizational basis for the creation of consultation firms.

N. Ya. Makarov: The demand for management consulting would grow even more if it were linked to concrete problems that are crucial to our society. One of these problems could be the changeover to the new conditions of management. In 1984 five branches were operating under the conditions of the large-scale economic experiment, in 1985 they were joined by 20 more, and since 1986 a considerable proportion of the branches have been working under the new conditions. But here in the local areas you will understand that there are very many issues that the people do not understand. I became convinced of this when visiting Blagoveshchensk and Khabarovsk. For the Siberians and Far Easterners are not always able to go for training, which is conducted by the ministry. They have a great shortage of local consulting.

R. R. Suleymanov: Today a manager of a local unit is squeezed within the framework of instructions, guidelines, and orders, so he cannot take a single step independently. But if a writer, a composer, an artist or any other creative person were expected to work in such a framework and he were given an assignment to create something, I think that mankind would never have received works of which we can be proud.

An enterprise has a very large number of planning indicators. Imagine what would happen if an aircraft pilot were told that he must fly to several points (all at the same time). The absurdity of such an instruction is obvious. But yet this is the situation in which the manager ends up when he tries to meet all of the indicators. As soon as you begin to pay attention to one, another one immediately "pops up."

We are attempting along with an aviation enterprise to create a comprehensive system for control and to reduce the work of all subdivisions to a unified mechanism. In aviation the functions of each service--flight, technical, passenger and cargo, and so forth--are strictly regulated. But there is no concept of management of the work of an aviation enterprise as a whole. We are trying to create this and to realize it in practice.

So far not many aviation enterprises are showing an interest in consulting. The demand for consultants demands largely on purely subjective factors, above all on the attitude of the manager of the enterprise. It is appropriate to note that aviation is a quite new, unusual branch for management consulting. Yet certain enterprises have already managed to develop a taste for work with consultants. Management personnel are glad to make contact and bring to the consultants problems of management that are essential to the enterprises. The communication proceeds largely through training of management personnel. The goal is to contribute to the development of the innovative potential of the organization. If it is low there will be no innovations.

Ya. A. Leyman: One cannot fail to take into account the large amount of long-term experience in management consulting in the world. It is quite possible to take advantage of the best devices and methods from the foreign technology of consulting. Because of contacts over the past 10-15 years with the Finns and other Scandinavian consultants, I can judge this reliably.

Applied research and development on management which we are conducting in our country could be more consultative in nature. All we need to do is change over from reports which are written after the fulfillment of agreements to real assistance to the enterprises. But it is not easy to change over to this. The working conditions are more difficult than with the traditional method of reporting.

EKO: Would it not be possible to clearly determine for the various points the distinction between consulting and the ordinary work of scientists with enterprises on the basis of agreements? Are there specific features here?

R. K. Yuksvyarav: We have suggested three concepts: the expert, the investigator and the consultant--and we have tried to formulate the distances. The investigator develops the theory and methodology, and conducts the research in a certain area, and at the end he draws up a scientific report. He can have various theoretical conclusions and suggestions, but they are not always practically useful for the given enterprise. Additionally, the report on the results of scientific research is submitted, as a rule, upon the completion of the work, as they say, this is the "diagnosis for 2 years." Much can change in such a long period of time.

We call a person an expert if he is well-informed and prepared to give the manager or other workers concrete advice immediately, answer questions immediately or as soon as he has evaluated the situation. Moreover, an expert can and should teach certain management methods, but he does not conduct large-scale research and does not engage in a complex of problems.

We call a person a management consultant if he combines the good aspects of two of the aforementioned specialists: he knows the methods, has profound knowledge in concrete areas of management and can approach a problem comprehensively. Two important aspects. First, neither he nor the managers need large reports. He can give a report of 5-10 pages. Second, he presents his results to the manager gradually, without waiting until the work is completed.

G. G. Abramishvili: I should like to draw attention to one of the aspects of the activity of the enterprise which is becoming more and more important today and should undoubtedly become a subject of management consulting. I am speaking about the interaction between the enterprise and the market for selling its products. Each enterprise has a supply and sales division. The ratio between workers of these divisions today is 8:2 in favor of the supply division. But the situation is changing rapidly. The farther it goes, the more production encounters the problem of selling its products.

The production of mass consumer goods is now being planned for enterprises of heavy industry branches. Many of them when they set out to fulfill this task develop technology and send out orders for raw materials, processed materials and batching items without a preliminary analysis of the possibilities of selling their products. As a result, it frequently turns out that there has been a mistake in the evaluation of the demand and the market refuses to absorb everything that has been produced. It is necessary to have a flexible

assortment policy. And, consequently, it is necessary to create in the associations services for studying and predicting the demand, and they must have the possibility of resorting to the services of consultants regarding an entire complex of issues related to planning the market policy for the enterprise.

All this seems especially important when it comes to products intended for export. Entering foreign markets with complicated machine-building products makes it necessary for specialists of the corresponding services of the enterprises, associations and ministries to master the necessary methodology for evaluating the export potential of the enterprise, the level of quality of their products, and their ability to compete, and they must also be able to develop what in specialized literature is called an export marketing program.

This is also very important for mass consumer goods. For example, we have no one who thinks about the selection of the name of the commodity. "Kristall" is the name of a radio and a cream for leather and a cologne...and this is the same in many other cases. The area of marketing consulting is very specific. So far there are not enough specialists. I think it is necessary to find a solution somehow.

EKO: What, in your opinion, must be done to solve these problems?

G. G. Abramishvili: The complex activity of the enterprise in the sphere of the domestic or foreign market should be planned, and this plan should become a constituent part of the plan for the development of the enterprise. As a rule, plans for the development of the enterprise are created on the basis of an analysis of the resource potential without taking into account the demands of the market or the special conditions for the sale and consumption of one product or another. It is necessary to change the logic of economic thinking. According to the concept of marketing, the adoption of decisions concerning what to produce, in what quantity, where and how to sell it, and at what prices, must begin with an analysis of the demand, opinions and needs of the consumers. The necessary information concerning the condition and dynamics of the demand are augmented by an analysis of the enterprise's resource potential, becomes the basis for planning the assortment policy and determining the necessary time periods for modernizing or updating the products. The plan for marketing or market activity includes also the price policy, advertising measures, the selection of forms and methods of sales, and the organization of pre- and post-sale servicing for the consumers.

In addition to working in the institute I was the deputy chairman of a section on problems of marketing under the USSR Chamber of Commerce and Industry. Since 1976 the section has conducted about 60 seminars and scientific practical conferences and it has published 10 collections of articles and materials on various questions of the production and sales policy of the enterprises on the domestic and foreign markets. The active members of the section included more than 10 doctors of sciences, several dozen candidates, representatives of VUZes, scientific research institutes and design bureaus, and specialists of various branches of the national economy. Up until recently our efforts have been directed toward developing methods and methodologies for utilizing the concept of marketing under the conditions of

the planned socialist economy and solving individual management problems in sales activity. Today we are trying to create within the framework of the USSR Chamber of Commerce and Industry (TPP) a cost-accounting subdivision which, on orders from industrial associations that are members of the TPP, could render them assistance in studying demand, evaluating the export potential and the ability of their products to compete, and developing comprehensive programs for marketing in the domestic and foreign markets.

EKO: Do you know of cases in which Soviet enterprises have turned to foreign marketing research organizations with orders for research on the corresponding markets?

G. G. Abramishvili: Yes, I do. Certain foreign trade associations periodically order such research from foreign firms. The cost of the research depends on its complexity and ranges from \$10,000 to \$30,000. The cost accounting research subdivision which we propose to create could in time become a powerful center for marketing research and management consulting. There are many difficulties on the path to its creation. In the first place, it is necessary to develop and approve provisions concerning such an organization with clearly delimited rights and duties, capabilities and responsibility. Second, it is necessary to solve the problem of how to pay the consulting specialists who are enlisted and at what rates.

EKO: We should like for other participants in the round table discussion to say how they envision the status of consulting organizations. What methods could they use for interaction with the clients?

#### "The Only Possible Form of Interaction is Cost Accounting"

Yu. I. Tychkov: The only possible form of interaction between the consultants and the enterprises is cost accounting. Only economic interest will lead to real responsibility. There should be a small firm with a staff of free specialists which has the right to conclude agreements with enterprises for the performance of work. The firm could enlist outside consultants.

When determining the level of competence of the experts it is useful to take advantage of the experience of downhill skiers and mountain climbers. The most qualified are granted an instructor's certificate. But if during the course of the year they do a bad job they are deprived of the right to be an instructor. The same thing could apply here. And the evaluation of the labor of the consultant should be provided not only by the managers of the firm, but mainly by those with whom he consults. It is possible to introduce a system of questionnaires. If the specialist does not collect the necessary number of points, the agreement with him is resolved.

I. P. Shkurenko: I envision the following organizational structure. A small intermediary firm of 10-20 people. The firm's staff has no consultants although, of course, it should have people who are highly qualified in problems of management. The task of this firm is to be able to get hold of outside consultants. Let us say that an enterprise has a desire for consulting. It goes to this intermediary office which selects the necessary specialists from the outside consultants.

N. Ya. Makarov: All proposals related to the creation of intermediary firms are unfeasible. Neither legislation nor financing is ready for this. If a comrade is working somewhere else he will hardly have the time to take for consulting. The development of management consulting must be linked to the peculiarities of our socialist society.

It is possible to create support consulting points. For example, the Sumy Machine Building Association has a scientific and methodological laboratory. When people come here they are informed about the Sumy system. Why can there not be such support points operating according to the self-payment principle?

Apparently the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences could be such a support point. There are also such organizations in other places. It is quite realistic to create a network of such organizations which would engage in consulting.

Take the Gosplan and its scientific research institutes. Here also there could be a group of specialists who do work that is related to management consulting. If we earmark and legitimize the staff positions of consultants and create such groups, we will profit. It seems to me that they must work in a particular institution, for otherwise they will be separated from practice and they will be of little use.

EKO: Do they need a particular certificate or the granting of the right to consult, as the mountain climbing instructors mentioned here do?

R. K. Yuksvyarav: Yes, they do. A consultant who does not justify himself should be deprived of the right to consult. A consulting organization should not be large, like a scientific research institute. It should be a sector of a scientific research institute or a subdivision at a special design bureau. But I am against organizations like consulting corporations or support points. They would not be organizations that are responsible to the clients. But I do not rule out the idea of an individual consultant. They could be enlisted as part of specialized consulting subdivisions as supernumerary consultants, and also on the basis of labor agreements between them and the enterprise.

R. R. Suleymanov: Consulting is a profession and it makes no difference at all where it is located: it can be in an academic institute, an applied research institute, in a center for scientific organization of labor and so forth. The managers should know that such a profession exists and where to find such specialists. A professional and ethical code should be created for the consultant.

#### A Concrete Suggestion

Within the framework of the VSNTO and the Scientific Economics Society it would be possible in the first stage, through sections and committees for consulting, to enlist specialists for this activity and conduct a certain amount of propaganda because propaganda and advertising of consulting are necessary at first.

At one time zonal centers or regular centers for scientific organization of labor were created to render assistance to enterprises when making organizational decisions. Unfortunately, they gradually became appendages of branch ministries and scientific research organizations. The introductory functions, if they exist at all, are secondary. But the reason they were created was never fulfilled.

EKO: Do you think the centers for scientific organization of labor are not very good organizations for consulting and that we need something new? What kind of organizational structure do you envision for consulting?

R. R. Suleymanov: It seems to me that there should be a combination of branch and interbranch consulting organizations. Centers for scientific organization of labor should consult on specific problems in the branches. But we also need interbranch organizations which would render assistance in solving general problems of management. These would be academic institutes and faculties of VUZes.

A. Ye. Luzin: A familiarity with the history of the leading consulting firms of the world shows that not a single one of them was organized "administratively," "out of nothing." All of them were created and gradually "grew up." At the beginning of each firm was its founder, a person with his own idea which during the course of time became the basis for the formation of a school of consulting or a group of successors who subsequently comprised the nucleus of the organization. Consulting activity is only one-third craft and two-thirds art. It is very difficult to cultivate the art within the rigid framework of bureaucratic formations. We should like to draw attention to the fact that of the several tens of thousands of consulting firms in the world 99 percent have a staff of less than 50 and only less than 10 have several hundred people.

It seems to me that in order to develop and coordinate consulting activity it is necessary to create a public organization--a voluntary alliance of consultants--an association of management consultants (analogous to the board of advocates or the creative unions). The association could be entrusted with the preparation of a draft of provisions concerning consulting activity, the system of payment for consulting services, requirements for candidacy for consultants, and so forth. For mediation activity between the organizations taking advantage of the services and the consultants, a cost-accounting service could be created as part of the association.

The association could also be assigned the duties of developing and maintaining contacts with foreign national and international associations of consultants. The most correct seems to be a gradual establishment of consulting activity in listing three groups of specialists: 1) professional consultants who are completely employed in this activity and carry it out independently under agreements with enterprises (50 percent of the consultants abroad work this way) or within the framework of a consulting division of one center or institute or another; 2) a consultant with a second job--a teacher, a scientific associate, a manager or a specialist on pension; 3) a practicing consultant--a manager or specialist of an advanced enterprise who has been

given the right for 2 or 3 days a month to render short-term assistance to similar enterprises that are interested in borrowing experience.

It would seem that the activity of professional consultants could be the basis for the formation initially of temporary groups which could subsequently be transformed into stable formations—consulting firms. In parallel with this there should be the development of existing organizations which are called upon to improve management methods. Here the society of consultants should render them complete support and assistance.

N. A. Starov: In 1982 the Committee for Problems of Management of the VSNTO created a commission for increasing the qualifications of management personnel and management consulting. The commission keeps a card catalogue of consultants and clients and organizes seminars for increasing the qualifications and exchanging experience among the consultants themselves. We offer regular certification of consultants according to the results of their activity and grant membership cards to the leading experts. So to some degree everyone—both consultants and clients—have partially adapted to the difficulties and conditions in which they have been placed. But the existing provisions for consulting groups must be changed and improved.

M. Ya. Khabakuk: Still I think that Yevgeniy Aleksandrovich Luzin is right: This problem cannot be solved administratively. Tomorrow we will be able to create large consulting firms and they will operate like special design bureaus of the management system under the ministries, in the same style and with the same results. The main problem, it seems to me, is training management consultants. They must comprise the nucleus of future consulting organizations.

If a person has experience in management work and at 35 tries to become a consultant, and if he has the talent for this, he can become a good consultant in 2-3 years. But if a graduate of a higher school, also someone who is talented, begins to work at this, as practice has shown, it would be difficult to expect any professional return for him in less than 7 years.

Yu. A. Tychkov: And what about experience in the West?

R. K. Yuksvyarav: It is approximately the same. The best consultants are those who have already worked as managers. They know what management is. When a manager whom they are advising knows this, he pays more attention to their advice. At the beginning of my work for organizing consulting I gathered together people who had gone through the practical school of management, gave them ideas, and the talented people developed rapidly.

R. R. Suleymanov: Is there a possibility in your republic of arranging for the status of the management consultant and the pay to be higher than that of a manager?

Ya. A. Leymann: The status, of course, can be raised. But a top manager of an enterprise is still more important, and the consultant is an assistant. But the consultant should be paid no less than the manager whom he is advising.

## Evaluation and Payment for the Labor of Consultants

EKO: We should like to hear how, in your opinion, it would be best to evaluate and pay for the labor of consultants? What kind of practice exists regarding this and what are your suggestions?

N. A. Starov: Managers of enterprises and organizations have the opportunity, under labor agreements, of inviting instructors from VUZes under the conditions of hourly wages for lectures, reports, consultation and analysis of concrete situations. A large group of scientists and specialists are now doing lecture and consultation work through the Znaniye Society. But the imperfect instructions concerning labor and financing complicate things. Yet when carrying out the development of the provisions concerning the consultation center under the historical archive institute, we turned to the historical experience in consulting in our country and discovered that during the 1920's there was a consultation bureau under the Institute of Management Techniques. Special provisions had been developed which were based on the principles of cost accounting and self-payment for consulting services.  
[footnote 2]

I. I. Prokopenko: All the half-measures that now exist and are being proposed here will not solve the problem. I am convinced that we need a special mechanism for consulting as a whole and special provisions. In the West there is the Code of the Consultant which determines the status and material and moral requirements. It is effective. Today even in the Academy of Sciences it is impossible to find consultants because without permission from the Presidium of the Academy candidates of sciences (it is easier with doctors) cannot be paid for consulting. They can be invited only on a public basis. It is possible to buy unnecessary equipment, furniture and so forth, but it is impossible to pay for useful consultation.

S. T. Pachin: We should pay after the consultation for the economic results.

Yu. I. Tychkov: I absolutely do not believe in direct accounting for the economic effectiveness of consulting. It is very difficult to single out which result of the work of the enterprise is related directly to the activity of the consultants and which is related to other factors. Therefore, in my opinion, it is necessary to establish payment for the time of consulting if only as follows: the expert has responded to an offer from the enterprise, he is given a problem, the time period is determined in the agreement, say 30 days, and the sum of the payment is determined on the basis of the rate he receives according to his qualifications as a consultant.

A. Ye. Luzin: Imagine this situation: the consultants have done a comprehensive diagnosis and come to the conclusion that everything is in order, that nothing should be changed. What is the effect from this work? How can it be calculated? In fact it could be very significant: for the actions of the consultants have released the organization from the need to make a large number of changes related to expenditures of financial and human resources.

Or: how does one evaluate the effect from the activity of a consultant who is a specialist in "process"? Change is taking place in the organization developed by its personnel under the leadership of consultants and the resulting effect cannot be credited only to the consultants. The more radical the changes, the longer the time interval before obtaining an effect. Sometimes this period is 3-5 years. Apparently this is why the absolute majority of consulting firms refused to utilize any other system of calculating remuneration than payment according to time spent. Thus the European Association of Management Consultants prohibit "calculating remunerations on any other basis than the agreed-upon scale of payments."

Apparently we should develop a scale of hourly or daily payments for the activity of consultants, and then divide them into two-three categories. There could be other forms: payment for an agreed-upon volume of work, payment of a certain honorarium to the consultant by the organization that uses his services for a long time interval in a small volume.

Ya. A. Leymann: Because of our more or less good knowledge of the technology of consulting and the experience accumulated in the republic over the past 15-20 years, we can still manage a great deal. But the rules of the game do not allow us to move forward. I shall explain my idea with examples. We cannot hire as consultants managers of various ranks. Some have come, but they have been quick to leave. One said this: "If in the company of friends I introduce myself as a consultant, nobody will understand what that is. But if I say 'head engineer,' it is clear to everyone that I am an important person." Even such nuances!....

Nobody knows what a consultant is. A management consultant, it turns out, is a co-author of poor management.... Therefore it is even embarrassing to admit that you are in the company of bad people. The payment system is unclear. People's control committees in the republic are constantly checking on it. We have created several methodologies for payment on the basis of the calculation of the economic effectiveness. The last was approved by the Scientific Council for Labor of the Estonian State Committee for Labor and Social Problems, and now the people's control committees treat us like human beings.

M. Ya. Khabakuk: Such legal documents as an order from the Ministry of Higher and Specialized Education, when speaking about organizations of the Minvuz system, or a decree of the State Committee for Science and Technology for Branch Organizations, make it possible to work under agreements. It is worse with short-term orders—diagnosis. This work can be done in 1 or 2 weeks. It takes more time to draw up the agreement than it does to do the diagnosis. Here it is necessary to use a fund not intended for people, and from the standpoint of workers of the Ministry of Finances this is suspicious.

G. A. Yavlinskiy: I am in an advantageous position since I hear everything. Yuriy Igorevich Tychkov said here: "If I can conceal reserves there is no need for a consultant to come and discover these reserves." If the system of the economic mechanism does not motivate an enterprise to turn over its reserves, can this problem really be resolved with the help of a consultant? Therefore it is not clear what to consult about.

How are planning and the economic mechanism constructed? In the area of planning we have fairly rigid regulation: there are almost no free products lists or free products. The large-scale experiment has shown that problems arise not so much during the formation as during the utilization of economic incentive funds, especially the fund for the development of production. And under the 12th Five-Year Plan conditions similar to those in the experiment will become the method of management for all of industry. This means that if we regard consulting as one of the means which should help to increase the effectiveness and accelerate the development of enterprises, first it is necessary to resolve general problems of real expansion of the independence of enterprises, and the creation in them of a vital interest in searching for reserves, and these problems must be resolved on a general scale. Therefore it seems to me that so far at the enterprises there is no sufficiently justified and broad subject for the economics part of management consulting.

At large enterprises there are, of course, certain specific issues of social psychology and interpersonal relations where there is some point in consultation. From what has been said it seems that, apparently, special organizations—cost accounting or others—should not yet be created for management consulting. The speakers have discussed centers for scientific organization of labor which should engage in consulting. Additionally, for practically every administrative problem we have scientific organizations and academic and branch institutes. There are also institutes for increasing qualifications. In the system of the coal industry there is the All-Union Scientific Research Institute of Management. It has this entire immense institute as its branch institute for management. There are also VUZes, general economics institutes such as the Scientific Research Institute of Labor, the Scientific Research Institute of Prices and so forth. What other consulting organizations are needed?

If the problem of consulting has become so crucial, let us resolve it with the help of the immense apparatus that already exists. What good are the doctors and candidates of economic sciences who have defended works on questions of economics and organization of the given branch of industry and are working in various branch organizations if they cannot consult and help the directors of the enterprises? And if they can, why is it necessary to have excess baggage when they already have the right to give advice? If we do not trust them, let us raise the broader question of certifying scientific personnel.

Seeing that the immense scientific apparatus is not working and is not effectively assisting production, we are again trying to solve the problem by creating a special agency. If every time we see a shortcoming we create an agency which is to eliminate this shortcoming, nothing good will come of this.

A. G. Aganbegyan: Summing up the results of our discussion, let us first of all define what consulting activity is. It is not research activity. Consultants are not scientists; they are specialists with production experience. The majority of them do not have and will not have a scholarly degree. This is quite a different and extremely specific kind of activity.

We are not the only ones on the planet. Many countries have experience, not only capitalist, but also socialist ones, where consulting activity is fairly broadly developed, and it produces a quite tangible effect.

This activity is important and it pays for itself many times over since it reveals reserves which cannot be revealed through other channels regardless of how good they may be. This is an extremely independent part of the improvement of management which we have not sufficiently borrowed.

I do not think that consultation organizations can be everywhere at one time without serious effort. The Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences has hundreds of offers for consulting. They cannot keep track of all the requests! But the demand depends not only on the needs of the organization, but also on the supply. As they say, supply generates demand. The majority of managers of enterprises with whom we have met are very responsible people who work, as a rule, for something more than wages. They want to achieve something better. It is another matter than not all of them always manage to do this. If they ask for help it is related to a significant degree to the fact that they do not know to whom they should turn.

What should we do next? Of course we should not wait for anything. As the experience of our Estonian comrades shows, a great deal can be done even within the framework of existing organizations and it is possible to broaden the scale of consulting work. There is no doubt that we should simultaneously look for ways of opening up the path to new forms. Apparently it would be expedient to think about creating the proposed Association of Consultants. Within its framework it would be easier and quicker to solve problems of the legal status, the development of the code of consultants and the system for their professional certification.

Undoubtedly the major problem about which all the comrades spoke is the personnel problem. No administrative documents concerning the creation of consulting organizations will produce anything at all unless they know who will work as consultants. Of course a good position will not go empty and enterprising people will be found to fulfill the vacancy. But to what avail? They will not bring honor to the new job. It is necessary to educate people. All of these questions must be contemplated.

I agree that it is not necessary to begin with large consulting firms. On the contrary, it would be better if there were small organizations that were clearly oriented and headed by qualified, enthusiastic people. In the Academy of the National Economy it would be possible to organize courses for training consultants.

In Novosibirsk certain jobs of the management consulting type have been created under the aegis of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the Academy of Sciences on a practically social basis. There was a desire to create a small specialized organization since many enterprises are requesting assistance with this kind of service. I came to the conclusion that our best bet would be to create a cost-accounting division at the academic institute which would be financed on

a separate line and would be self-paying. Now, under the new conditions concerning wages, the scientific research institutes and design bureaus have fairly great latitude and people can be paid for the work which the enterprises would finance on a cost-accounting basis.

It is necessary to search for new methods of organization and management. Comprehensive improvement of management is one of the most important conditions for implementing the strategy of accelerated socioeconomic development that was drawn up at the party congress.

#### FOOTNOTES

1. EKO, No 8, 1980; No 11, 1984.
2. This is discussed in greater detail in the appendix to the "Round Table."

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## HISTORY OF MANAGEMENT CONSULTING RELATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 80-86

[Article by N. A. Starov, candidate of economic sciences, and A. D. Kuzmichev, Moscow State Historical Archive Institute: "From the History of Managing Consulting"]

[Text] The movement of scientific organization of labor and management during the 1920's, with V. I. Lenin at its source embraced many spheres of the life of the society. One of the first organizations engaging in streamlining administration was the "Initiative Commission formed by 1920 as part of the higher council of the national economy [footnote 1]. The basic directions for its activity were:

The Development of General Principles and Paths of Scientific Organization of Production and the drawing up of concrete measures for clients that were especially singled out:

instructions for main administrations of the VSNKh on questions of scientific organization of production;

systemization of the work experience, propaganda of ideas and consulting on scientific organization of production.

The management unit of the initiative commission was a bureau which included the chief, his assistant and the chiefs of two divisions; for systematization and processing of information received from the plants; and for consultation and guidelines regarding questions of scientific organization of production. Participating in work of the commission were eminent specialists in scientific organization of labor who were elected as corresponding members of the initiative commission. In the spring of 1922, because of the tasks of the new economic policy which were directed toward overcoming the consequences of the war and restoring the national economy, all work for introducing the achievements of scientific organization of labor into production which had been done by the initiative commission was changed over to the conditions of cost accounting [footnote 2]. The practical experience of the initiative commission was utilized by the first economic agency in the country for streamlining the state apparatus, which appeared in 1923 also as a part of the

VSNKh--the Bureau of "Standardization." The bureau included four divisions: record keeping, structural, bookkeeping and editorial-publishing, which was responsible for the publication of the journal SISTEMA I ORGANIZATSIYA.

Like the initiative commission, the standardization bureau was created because of essential tasks of socialist construction, the most important of which, as was emphasized in the decisions of the 12th Party Congress, was the task of radically changing and systematically improving the organization of the entire state apparatus. From the first days of the bureau's existence its activity manifested a clearly expressed practical direction of work, which included organization of document turnover and arrangement of record keeping in institutions, the development of forms of documents for the applications of institutions and consulting on practical application of the better models in institutions and at enterprises; organizational planning and supply of record-keeping services with office supplies [footnote 3].

In a relatively short period of time--from May 1923 through 1924--the bureau conducted measures for improving management labor at more than 60 institutions, for streamlining office work, the forms of documents, organizational structures and so forth [footnote 4].

And in Leningrad there appeared the first territorial agency for streamlining management--the bureau for scientific organization of labor of the State Central Laboratory of Labor at the Leningrad Institute for Studying the Brain and Psychological Activity. It also operated under conditions of cost accounting.

The main task of the bureau for scientific organization of labor was the concrete study and improvement of the work of institutions and enterprises in Leningrad and the oblast [footnote 5]. While the initiative commission conducted streamlining in the sphere of production, and the Standardization Bureau in the sphere of management, the work of the bureau for scientific organization of labor encompassed the entire economic mechanism of the region.

At the same time public organizations were created which contributed to streamlining management: in 1923 there appeared the "Time" league with V. I. Lenin as the honorary chairman. In 75 cities there were 44 cells of the League which included about 1,000 members. In July 1924 the Leagues for Scientific Organization of Labor appeared, in 1926--the Society of Workers in Scientific Organization of Labor, and in 1928--the Association of Workers in the Area of Scientific Organization of Labor, Production and Management Techniques (ARNOT).

In March 1924 there was an all-union conference for scientific organization of labor at which V. V. Kuybyshev spoke. The NK RKI SSSR [People's Commissariat of the Worker and Peasant Inspection of the USSR] was named the only center which would plan and guide all efficiency work for management in the country. The conference established that the interrelations among efficiency agencies and objects of streamlining should be embodied in commercial contractual form.

The activity of the "Standardization" served as the basis of the creation on a statewide scale in the USSR of an agency for streamlining the state

apparatus--the State Bureau for Organizational Construction, "Orgstroy" (December 1924) which has left a significant mark on the improvement of the system of management. The Orgstroy bureau was created in the form of a stockholding company. The work was done under orders from organizations on a cost accounting basis. Orgstroy workers conducted research on objects, analyzed the existing organization of management, and developed proposals for improving structures and management techniques. Each group was headed by a manager consultant. Individual work was performed by instructors of the bureau who worked independently.

In January 1926 the State Institute of Management Techniques (ITU) was created --a specialized scientific center for streamlining management. The ITU structure included a consultation bureau whose workers render practical assistance on a cost accounting basis to managers of enterprises and organizations, conducted exhibitions of scientific organization of labor. Provided instruction and held weekly meetings with efficiency experts of department administrations, and supervise the publication of the monthly journal TEKHNIKA UPRAVLENIYA.

The illustrated prospectus published in 1929 by the TEKHNIKA RPRAVLENIYA Publishing House of the consultation bureau of the Institute of Management Technology entitled "Consultation on Streamlining Institutions and Enterprises" gives us an idea of the content of the bureau's activity. It helped in streamlining and equipping work positions, improving agencies for managing finances, social security, municipal services and so forth.

The prospectus presented methods of streamlining management with an indication of individual work devices and statement of tasks for consultants. The appendix includes questions on office work, the organizational structure and so forth--a kind of "campaign against illiteracy" for the client--in order to facilitate for the client the formulation of questions on which they need consultation that arise in their practice.

For more planned and systematic utilization of consulting services the bureau introduced paid subscriptions. One was for institutions and enterprises of Moscow and the other for those in other cities, through which the clients could obtain written individual consultation and standard developments. Enterprises in other cities were sent a list of individual consultation so that they could request any of the innovations that interested them. This request was filled with a 50 percent rebate.

In February 1928 the Board of the NK RKI SSSR issued a special decree concerning expansion of agencies for departmental streamlining of administration. But during the 1930's they gradually began to forget about management consulting. Scholars at MGU express the viewpoint that the attraction of experts in scientific organization of labor to Taylorism led to an elimination of bureaus and institutes for efficiency work [footnote 6]. A candidate of sciences from the Moscow State Historical Archive Institute, V. S. Mingalev, thinks that this took place because specialists in streamlining of management were transferred to branch organizations and became "internal" consultants. Thus subdivisions of agents for departmental efficiency work appeared, the majority of which subsequently ceased to exist. But certain

organizations had remained up to this day. These are trusts like Orgstroy and Orgtekhnstroy in the construction ministries, Orgenergo in the USSR Ministry of Power and Electrification and certain others. Their functions have changed somewhat: more attention is devoted to consulting on engineering problems than on management.

In keeping with the decisions of the 27th CPSU Congress, more attention is being paid to improving the economic mechanism and increasing the creative activity of managers and specialists of production collectives. Under these conditions, in our opinion, attention should be paid to methods of improving management which has already been applied successfully in our country.

#### FOOTNOTES

1. TsGANKh SSSR, f. 3249, op. 7, d. 77, ll. a-16 a.ob.
2. Ibid., d. 1252, l. 8.
3. SISTEMA I ORGANIZATSIYA, No 2, 1923, p 25.
4. Ibid., No 9, 1924, p 32.
5. Ibid., No 10, p 37.
6. "Organizatsiya sovershenstvovaniya upravleniya proizvodstvom" [Organization of Improvement of Management of Production], ed. by G. Kh. Popov, Moscow, "Ekonomika", 1977.

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## TRAINING OF NEW SPECIALISTS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 126-148

[Article by T. M. Boyko, "Specialists for New Scientific and Technical Areas"]

[Text] "To improve the quality of training and increasing of qualifications of personnel, mainly in new specialties related to scientific and technical progress."

Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up the Year 2000

"Personnel who have mastered technical equipment decide everything!"--this basic slogan of the reconstruction period, with the adjustment of time, has again become crucial. The implementation of the course adopted by the party toward a radical acceleration of scientific and technical progress places stricter requirements on the training of new specialists who are capable of creating and utilizing automated equipment, flexible productions, universal processing centers and robot equipment, mastering biotechnology, genetic engineering and so forth.

As was noted in the speech of the member of the Politburo of the CPSU Central Committee, Secretary of the Party Central Committee, Ye. K. Ligachev at the 27th CPSU Congress, in the sphere of education there are at least two fairly complicated tasks. "First, to provide for more rapid development of the secondary and higher schools, even as compared to technical reconstruction of the national economy. Second, to arrange or, rather, restructure the state system for retraining and continuous professional growth of personnel. Socialism cannot allow and does not allow for scientific and technical progress to result in a situation where considerable groups of workers, and their numbers could reach millions, turn out to be superfluous people in the society who are not prepared to work under the new conditions."

But how should one change the goals, content, forms and methods of training and which problems accompany the training of new specialists? The editorial staff has requested that these and other such questions be answered by the rectors of the leading VUZ's and managers of large enterprises and associations. We thank everyone who responded to our questionnaire. We hope that the results of the questionnaire will help to some degree to move forward in this matter which determines scientific and technical progress.

### Anticipatory Training

Under modern conditions, in order to avoid numerous difficulties with the development, introduction and assimilation of new technologies and technical equipment and to avoid reducing their return, it is necessary to train personnel in advance. How is the higher school reacting to this demand of the time?

The Moscow Chemical-Technological Institute imeni D. I. Mendeleyev (MKhTI) is opening up new specialties, as a rule, as a result of broad scientific research institute in the corresponding branches. Here is a typical example. Professors of this institute, I. I. Kitaygorodskiy and N. M. Pavlushkin, have developed a technology for producing glass and crystal materials on the basis of metallurgical slags ("slag glass ceramics"), for which they were awarded the Lenin Prize. This technology was introduced at the Konstantinov Avtosteklo Plant. On the basis of this they have developed a new finishing material—synthetic granite (sigran). Specially trained personnel were needed and MKhTI opened a new specialty—"technology of slag glass ceramics."

This institute is also training specialists for other new technologies: materials for semiconductor instruments and quantum electronics, microbiological productions, obtaining carbon, and in the specialties "cybernetics of chemical-technological productions" and "industrial ecology and environmental protection." The decisions to open the new specialties are developed on the basis of joint substantiated and timely proposals of the MKhTI and the branch.

Far from all the VUZes and enterprises managed to achieve such enviable unity. For example, the Moscow Machine Tool Building Institute (Mosstankin) 5 years ago (in the opinion of the institute, this was timely) came out with an initiative to change over to the target-program method of training personnel for future areas in machine building. The main difficulty the VUZ experienced when determining the set of specialties and their content consisted in that not a single machine building branch was able to formulate even partially anything like a "technical assignment" for the modern specialist. The institute had to do this itself, and then prove at various levels the expediency of precisely this approach.

In the Khabarovsk polytechnical institute, since 1982 (in the opinion of the institute, the right time) they have been training systems technicians in the

specialty "electronic and computer equipment" and in 1985 they opened up the specialty "automation and telemechanics," even though the need for the corresponding specialties had appeared at the beginning of the 11th Five-Year Plan when electronics industry enterprises began to appear in the Far East.

Workers of the Chelyabinsk and Tomsk Polytechnical Institutes, anticipating the growing needs of industry for robot technologies, tried ahead of time to begin training them within the framework of the traditional specialty "technology of machine building, metal cutting machines and instruments" using internal reserves (training plants and programs). They have been training these specialists for 10 years, but the Ministry of Higher and Secondary Specialized Education until recently has stubbornly refused to recognize this specialization. This is hardly a normal phenomenon. More and more workers of the higher school are complaining that the ministry has refrained from establishing these specializations in central institutions and has insisted on assigning them to VUZes. A good deal of freedom on the part of the institutes in this area would make it possible for them to react more efficiently:

to the level of the base, pre-VUZ training of freshmen, the selection of instructors and the prospects for utilizing graduates of a specific VUZ. For instance, if in a given year a VUZ has no competition and the student ranks are filled basically with far from outstanding students, there is no point in entrusting it with the training of personnel for science and it would be more expedient to concentrate efforts as much as possible on the production disciplines and provide good specialists for production;

to the changing needs of production. For example, the Voronezh Polytechnical Institute began training specialists in the area of SAPR using concrete automated work positions (ARM) in which they will work after completing the VUZ. If years are spent on establishing the corresponding specialization, during this time the ARM can change and the procedure will have to be started all over....

Are industry's needs for new specialists being satisfied? Let us learn the opinions of the consumers.

L. V. Markin, director of the Barnaul plant for transport machine building imeni V. I. Lenin: "In recent years at our plant we have introduced robotized modules, automated testing of diesels, and mechanical processing of parts using high precision, highly productive equipment. We operate more than 20 varieties of systems with numerical program control, including those based on microcomputers. There are practically no specialists to operate them. In order somehow to "cover" this problem, we are forced to retrain electricians to become electronics adjusters and electrical engineers to become electronics experts at enterprises of the Ministry of the Machine Tool and Tool Building Industry which deliver the equipment to us. The plant is constantly short about 200 skilled specialists.

"We receive mainly graduates from the Altay and Tomsk Polytechnical Institutes and the Siberian Metallurgical Institute. The majority of them do not have enough practical knowledge and they are not very familiar with innovations in modern equipment, not to mention the technical equipment of the future. There

has been a marked reduction of the social activity of the graduates and many are not prepared to overcome the difficulties and engage in self-education in order to grow and to occupy a higher position in the future. Only after 2-3 years of additional training in the plant and work on individual and special assignments do the young specialists reach the level of competence we need. Our direct ties with the VUZes that provide personnel are minimal."

A. Ye. Maltsev, acting director for economics and planning of KamAZ: The association has a well-arranged system of technical education, electronic and microprocessor equipment, and automated and semi-automated lines. In 1985 alone we assimilated a whole number of progressive technologies which are producing a significant economic effect. We selected the specialists and trained them even during the period of construction of KamAZ and sent them for on-the-job training at related enterprises. The ones they send us now have not properly developed their style of engineering and economic thinking and they do not have enough proper skills for working under the conditions of a rapid increase in the volumes of information and the need to process it with means of automation. In our opinion, the training of new specialists, both in quantity and in quality, lags behind the rates of introduction of modern technical equipment and technology."

N. P. Belous, general director of the Ukrlektromash Production Association: "Our association is constantly improving the designs of electric engines we produce and the technology for producing them. This requires skilled personnel. Our specialists are trained basically at VUZes at Kharkov. Unfortunately, our orders are not always completely filled. Thus during 1982-1984 we failed to receive 17 graduates in various new specialties.

"And those we receive far from always meet our requirements. Here are some results of a sociological investigation conducted in March 1985 at the Kharkov Electrical Equipment Plant. During the time of their on-the-job training only 33 percent of the young specialists performed their work with a high rating, 67 percent experienced obvious difficulties, and 66 percent of those who were questioned displayed no interest in their occupation. Only 22 percent of the young specialists tried to introduce something new into their work and 44 percent performed it with standard methods and were not very interested in innovations in the corresponding sphere. Of those who were questioned, 11 percent were quite uninformed about the scientific and technical achievements in their specialty. The difficulties during the first year of training of 89 percent of the specialists were explained by the inadequate theoretical training and the lack of practical experience, and 11 percent--by their own personal peculiarities."

"Our plant critically needs skilled specialists," writes the director of the Novosibirsk Plant for precision machine building, Zh. F. Kryuchkov. "I shall list only certain areas where the shortage of personnel is creating special difficulties: these are the application of microprocessors in control systems, control and processing of information in diagnostic systems; technology of precision mechanics; the development of technological processes for mechanical processing, assembly and control programs for machine tools with numerical program control; the development and introduction of flexible production systems, and robot-technical complexes; the utilization of progressive

electrophysical and electrochemical methods of processing; the technology and design of fittings for casting parts from plastic.

"The enterprise receives graduates from the Tomsk, Ivanovo, Kazan, Kuzbass and Kuybyshev Polytechnical Institute, the Novosibirsk Electrical Equipment Institute, and others. The level of their theoretical knowledge is basically adequate, but they know little about the requirements of practice. Only after working for 1.5-2 years at the plant under the leadership of mentors are they ready to do independent work."

S. S. Tarasenko, head engineer of the Dnepropetrovskiy Kombaynovyy Zavod imeni K. Ye. Voroshilov Production Association: "We have no higher educational institutions especially assigned to us. Young specialists come to us through placement through the Ministry of Higher and Secondary Specialized Education, but this is clearly inadequate. Our annual vacancies for technologists, fittings designers, electronics experts and so forth are 18-24 people, and we submit orders for training 15-20 specialists and receive eight. Unfortunately, they are poorly trained in questions of designing fittings, automation and electronics, not to mention methods of planning flexible lines."

"The current system for distributing young specialists does not make it possible to cover the needs of automotive construction for mathematicians, electronics experts, skilled programmers and so forth," thinks the chief of administration for personnel training of ZIL, A. N. Feoktistov. "Therefore enterprises of the Ministry of the Automotive Industry are forced to organize the training of the corresponding specialists directly in production and in branch training institutions. This entails many difficulties related to expansion of training areas, the acquisition of modern instruments and computers, and the selection of skilled instructors."

The consumers (with rare exceptions) have painted a depressingly homogeneous picture. Frequently there are not enough numbers of skilled specialists who quickly react to new things, nor do they have sufficient ability. Many of our problems come about because the higher school provides mass, "general" training of engineers, and production uses them individually. In places where this has been deeply recognized and have tried to rearrange things by strengthening the precise production orientation and the expediency of training, things proceed more successfully. In the political report of the CPSU Central Committee to the 27th Party Congress the task was set "to arrange in a new way the interrelations between the higher and secondary specialized schools and the branches of the national economy, and to increase their mutual interest in raising the level of training and retraining of personnel and radically improving their utilization in production."

#### An Engineer Under Contract

Direct contractual ties between the enterprises and the VUZes help to determine precisely how many and what specific kinds of specialists are needed and for what periods they should be trained for a given enterprise. Under modern conditions a plant frequently requires engineers in several specialties at the same time. Large VUZes are capable of training a group of these

specialists who have the same views on devices and methods of solving problems facing the enterprise. Here the VUZ and production are jointly responsible for the quality of training. Managers of enterprises and rectors of VUZes have unanimously spoken out in favor of strengthening creative cooperation.

A. A. Gusev, general director of the Tallinn Production Association for Radioelectronic Equipment: "In order to obtain the necessary specialists who have a deep understanding of specific areas, we annually select approximately 10 students from the third and fourth courses of the Tallinn Polytechnical Institute. The institute in conjunction with us draws up special training programs. Even during the time of training the students work actively on the association's subject matter and they are obligated to take their training practice here."

V. M. Vologzhin, general director of the Lvov Konveyer Production Association: "We have concluded agreements with the Lvov Polytechnical Institute and the MVIU imeni M. E. Bauman. Two-thirds of the group of students (10-15 students each) are selected after the first course. Each is assigned a leading specialist of the plant who helps the student to engage in production and technical activity and prepare real diploma projects suggested by the enterprise. These projects must be defended in production. Even during the process of training one can see the student's inclinations and which job would suit him. These graduates immediately demonstrate practical understanding and professionalism. In our opinion, for developments of a high level that are recognized by the technical council where the diploma project is defended, the diploma recipient should be paid no less than 300-400 rubles."

Not many specialists are being trained under direct contracts yet. Here, for example, are the statistics for KamAZ.

#### Training of Specialists for KamAZ in 1981-1985

	1981	1982	1983	1984	1985
Number of VUZes assigned to the association by the Gosplan	56	45	30	49	38
Number of specialties	58	56	53	50	42
Demand for specialists	1358	856	690	410	410
Specialists assigned	740	414	279	344	243
Arrived at KamAZ	553	317	304	296	--
Number of specialists trained under direct agreements with VUZes	102	48	4	28	--

What is keeping the associations from changing over more actively to progressive direct ties with VUZes?

O. S. Osintsev, deputy general director of the Uralmash PO: "Our association is provided with personnel from more than 40 VUZes located in various regions of the country, and approximately 20 of them are constantly changing. On the other hand, Uralmash as the base enterprise is assigned for practical training to more than 42 VUZes and teknikums, more than half of which do not send us personnel. Each year we accept up to 600 students for practice training, and

only 30 of them who are already familiar with Uralmash come to work for us. What material interest can the enterprises have in training specialists? With such a kaleidoscope of VUZes it is difficult to establish long-term personnel contacts. And, as we have been convinced from our own experience, these contacts are a reliable support for the development of a material and technical base for the institute and training of engineers who made the requirements of scientific and technical progress. We have established direct ties, in particular with the Izhevsk Mechanics Institute. Its students are sent to the association 1.5 years before completing the VUZ (they are thinking about sending them to us for practical work after their second year), they come to us for prediploma practice and they defend real diploma projects.

"It would be good to make a decision to have a large enterprise staffed with specialists from no more than 20 VUZes.

"No less critical for us is this problem: The USSR Ministry of Higher and Secondary Specialized Education distributes specialists, unfortunately, without taking into account the existing specializations within the specialties. For example, Uralmash receives graduates of the Magnitogorsk Mining and Metallurgical Institute in the specialty "Processing of Metals by Pressure" with the specialization of pipe rolling and wire production, but we need specialists in forge and press production. We receive the specialists and immediately retrain them. The real return from them is postponed significantly. It is time to put this in order."

Uralmash is not the only one that is bothered by the geographical locations of the VUZes.

M. M. Mayzholov, deputy director of the Karaganda Metallurgical Combine: "Sixty percent of the young specialists trained by VUZes of the RSFSR and the Ukraine after working out their prescribed time return to their own regions, and graduates of the Temirtau Plant-VIUZ and the Karaganda Polytechnical Institute, as a rule, remained to work in the combine. According to data from sociological research conducted by us in 1976 and 1979, the potential turnover of graduates from this plant-VIUZ is one-fifth of that of institutes in other cities. This tendency is not changing with the years. During 1981-1984 74 engineers who were sent here never arrived at the combine. And graduates of the Azerbaijan Institute of Petroleum and Chemistry, although they arrive at the combine, have such a poor knowledge of the Russian language that professional problems recede into the background.

In this case is it worthwhile generally to send them outside the republic? The Karaganda Metallurgical Institute is far from the only one with these problems. Many Siberian enterprises feel that they are just a transfer base where young specialists "work out their 3-year period." Both the enterprises and the students are interested in having the authorized agencies pay proper attention to the territorial principle. It is not a new problem, but, unfortunately, it is being resolved slowly.

Let us take a look at this problem through the eyes of another partner in direct agreement.

Now the RSFSR Ministry of Higher and Secondary Specialized Education is conducting an experiment in 17 higher educational institutions in 26 specialties on target intensive training of students (TsIPS). In essence, this is the same thing that the leading VUZes of the republic have become convinced of independently. The institutes have been given a task of providing for training of personnel under direct agreements with enterprises (mainly for new scientific and technical areas), combining fundamental knowledge with a high professional level and work skills in the corresponding area. It was necessary to rework the training plants and programs, to create new textbooks and leadership, to retrain instructors, and to utilize more effective training methods.

Agreements, in particular, establish which technical equipment the plants should deliver to the VUZes. This helps to create a material and technical base for training that is adequate to the modern level of scientific and technical progress. But this is still far from being ideal. For example, means of flexible automation intended especially for training are not produced in our country. Therefore, at best, the laboratories are compensated with equipment for production purposes. On the one hand, this produces a positive effect--the students learn in conditions that are close to those in production, and on the other hand--the utilization of production equipment causes many difficulties in the VUZ: it is necessary to have large laboratory spaces on the first floors of the buildings, a pneumatic, industrial electric current, stabilization of this current, and so forth.

The Chelyabinsk Polytechnical Institute is also participating in this experiment. Under the TsIPS it manages to train only 15-20 percent of the graduates in the corresponding specialties, and this is mainly for plants that are located within the oblast and have scientific contacts with the institute. In 1984 this VUZ distributed a total of 2,190 specialists to enterprises of 57 ministries, as a result of which 300 plants received only one graduate each. Here is a situation analogous to the one described by the managers of the enterprises.

A. K. Tashchev, pro-rector for training work of the Chelyabinsk Polytechnical Institute, doctor of technical sciences, professor: "We train specialists specifically for the division of automated systems of programming, control and robotization of the Chelyabinsk Tractor Plant. With the participation of the students the institute has developed an SAPR for routing-operational technology for the Kyshtym Radio Plant and SAPR for technical operations processes using the YeS computer for the Chelyabinsk Plant for Construction and Road Machinery. These same young specialists are successfully introducing and operating them. That is, along with the system we "release" specialists to the enterprise. This approach essentially accelerates the introduction of the system and adaptation of the graduates, and it helps to form new subdivisions at the plant that are more receptive to scientific and technical progress.

"Understanding how promising this form of training is, we have determined the need of the enterprises of the Urals for the corresponding specialties. The Ministry of Higher and Secondary Specialized Education has approved this work. But when it came around to concluding agreements everything fell apart: it

recommended that we be guided by the proportions established by many years of practice of distribution and not 'break out' of the chain 'Gosplan-ministry-enterprise.' What kind of direct ties are these? One hand has approved the work and the other has abolished it."

G. S. Nechiporuk, pro-rector for training work of the Kharkov Polytechnical Institute: "Not all enterprises understand the importance of joint training of specialists, especially when it comes to assisting the institute with modern equipment. The ministries are unwilling to expand the TsIPS because the graduates are distributed according to a plan which is not linked to the contractual form of training. That is, after having spent effort and money, the enterprise may not receive the expected specialists who are oriented toward its problems unless the Gosplan assigns the corresponding number of graduates in the plan for distribution."

"So far one gets the impression that in the USSR Gosplan, which is in charge of distribution, they have not heard about new, more durable direct ties between the higher school and production collectives and do not even give credit for the practical value of this initiative, which has already been proved. From year to year, the plans do not give any advantages to our faithful allies. The relatively small Moscow Institute of Electronics Machine Building previously sent engineers to 40 different enterprises and it continues to do this in spite of the fact that the need for specialists of this profile and these qualifications vary. Some enterprises literally suffocate without them while others cannot yet find work positions that correspond to their training. At this complicated turning point in the country's development, when it is necessary to concentrate all forces on key sections of scientific and technical progress, such "equalization" and, in essence, dispersion of highly qualified personnel who are in short supply is absolutely inadmissible," writes the rector of the Moscow Institute of Electronic Machine Building, doctor of technical sciences, Professor Ye. V. Armenkiy [footnote 1].

#### Planning "For the Task"

Practice insistently dictates the need to develop a well-arranged system of interaction between the branch and the higher school both in training and in the area of scientific research and the social sphere. Now, even if such contacts exist, they are frequently due to the initiative of groups of enthusiasts who have been able to overcome the numerous obstacles.

"It would be good to unify the actions of the branches and the VUZes with certain organizational devices, the main one being unified, all-around planning for the common goal (the scientific and technical problem)," thinks the rector of Mosstankin, doctor of technical sciences, Prof Yu. N. Solomentsev. "All-around planning 'for the task' would determine and unify the ministries developing the given long-term scientific and technical problem and the specific VUZes, which are oriented at the right time for supplying personnel."

Even now comprehensive scientific and technical programs contain indirect information about future needs for various kinds of specialists. "Why not

concretize this information and thus largely avoid the personnel problems? The USSR State Committee for Science and Technology should include in these programs 'orders for specialists' with the corresponding provision for their training," suggests the rector of the Moscow Aviation Technical Institute imeni K. E. Tsiolkovskiy, doctor of technical sciences, Prof B. S. Mitin. "Without people, as we know, any technical equipment runs the risk of ending up dead."

#### Material Interest

With close, fruitful scientific and personnel contacts, it seems, the branches would be considerably more willing to "share" their means with the VUZes and help them to train specialists on advanced technical equipment. One of the forms of strengthening mutual contacts, in the opinion of Yu. M. Solomentsov, is to make the VUZ responsible not only for specific training of personnel, but also for retraining of specialists who were not already working. In particular, the institute could arrange regular augmentation and evaluation of their knowledge through the correspondence form of training, for instance, they could prepare and disseminate materials concerning the corresponding scientific and technical achievements for independent study, give lectures, and conduct practical classes and business games. And then once or twice during the 5-year period they could verify their knowledge. If a worker has not passed the test, even after the third time, there arises a question of whether he is appropriate for the position he holds and, consequently, the question of revising his wages.

Another progressive form of retraining personnel are at specialized faculties at large VUZes. "Such faculties can satisfy much more easily, more rapidly and with fewer expenditures the 'peak' demand for specialists in new areas of science and technology, that is, the demand in the stage of extensive introduction of new methods and equipment. As it is satisfied, it is reduced to a certain stable amount. And it is apparently this stable amount that should be the point of reference for the higher school when organizing new specialties," thinks B. S. Mitin.

Frequently it is not simple for directors of enterprises to "share" funds and modern equipment, even if they are very willing to. Some, in spite of difficult conditions, still find the possibility of allotting money for constructing training facilities and dormitories and acquiring laboratory equipment and computers. While others, blaming objective factors, prefer to hide behind the solidly rooted deceptive appearance that professional knowledge and ability of new specialists are to be provided for production "free of charge." The apparent inexpensiveness of higher education costs the state a great deal and impedes good training of personnel.

It is necessary to make enterprises and VUZes more materially dependent on the number of young specialists, their qualifications and the quality of their training. Of course it would be incorrect to subject the training of all specialists to "economic logic." Some of the specialties should be financed exclusively from the state budget. But many can be changed over to joint support by transforming this into an effective lever for managing the higher school.

Yu. V. Seleznev, rector of the Omsk Polytechnical Institute, doctor of technical sciences, professor: "Specialists of our institute who engaged in the study of this problem came to the conclusion that it is better to take 'payment for specialists' out of the profit of the enterprises than, say, to include it in the production cost of the products. This approach is not without certain shortcomings, but they can be sidestepped. For example, it can motivate managers not to order specialists from VUZes, but to lure them away from other enterprises. In order to eliminate 'job hopping' it is necessary, in particular, in the five-year and annual plans for the development of enterprises to establish assignments for augmenting the number of engineering and technical personnel through recruitment of young specialists. When the production of new products is being assimilated the demand for specialists increases sharply. In order to make reimbursement for above-plan expenditures on their training, it would be expedient to utilize funds allotted to the enterprises for special purposes out of the branch unified fund for the development of science and technology. The unutilized funds should be transferred to the budget.

One of the conditions ensuring self-repayment and increased effectiveness of the activity of the cost-accounting VUZ is its operation strictly in keeping with the plan developed on the basis of scientifically substantiated norms and normatives. The Ministry of Higher and Secondary Specialized Education should establish only the output of engineers in the various specialties, the limit on a number of professor and teaching personnel and workers in the scientific research sector, the volume of contracted scientific research work, the economic effect from the introduction of scientific research work and the wage fund. All the other indicators serve as a basis for the established indicators and evaluation indicators. The following normatives will be needed: expenditures on the training of specialists, the number of students per instructor, deductions into the economic incentive fund, and also the qualifications structure of professor and instructor personnel. Among these a special position is occupied by a normative of expenditures on training specialists which is stable for the five-year plan and which is calculated taking into account estimated expenditures on the maintenance of the VUZ: the normative of their amount conditioned by the development of scientific and technical progress and improvement of the qualifications structure of professor and teaching personnel; expenditures on contracted scientific research work; and normative profit. The institute's income from its basic activity is determined by multiplying this normative by the number of specialists being training. This is approved in the Ministry of Higher and Secondary Specialized Education and coordinated with the client branches, receiving specialists.

"Cost accounting presupposes expansion of the operational management independence of the VUZ, above all in the development of the plan for the graduation of specialists. When drawing up this plan the VUZ must, in addition to the control figures established by the Ministry of Higher and Secondary Specialized Education, take into account the demand of the consumers for engineers in various specialties. This is revealed through agreements with the enterprises. At the same time, the VUZ has greater responsibility for studying the demand of the enterprises for its graduates and for the

quality of their training. An increased demand for graduates of a given VUZ can be regarded to a certain degree as a generalized indicator of the quality of training.

"Cost accounting also presupposes the creation of economic incentive funds in the VUZes. The basic source for these is profit. As fund-forming indicators one can use the graduation of specialists and the quality of their training, and additional indicators can be the volume of contracted scientific research work or the amount of the economic effect from the introduction of scientific research work."

It is extremely important to develop correct criteria for the quality of training. And, of course, these criteria cannot be those indicators which the Ministry of Higher and Secondary Specialized Education carefully checks on and on which the well-being of the educational institution depends on any case. The VUZ must be responsible for the specialist and not for the student. Production workers now have the impression that the higher school is the only branch which does not bear responsibility for the quality of the products it produces.

Yu. V. Sobolev, rector of the Kharkov Institute of Rail Transportation Engineers, doctor of technical sciences, professor: "The consumers should evaluate the work of the VUZ. To begin with, it is necessary to develop methods for evaluating the work of graduates in production during a 1-year and 3-year probation period. In order to simplify the processing of information the direct supervisor, with the participation of chairmen of party and public organizations, can evaluate the work of the young specialists using a 4-point system. These evaluations are sent to the VUZ, which processes them according to the various specialties, faculties and institute as a whole, and receives fairly objective information about the level of training of its graduates and what changes must be made in the training process. It would be good for specialists to be granted diplomas only after they have properly proved themselves in production and the enterprise has submitted positive reports about their training to the institute."

"Now enterprises submit reports to the institutes from the results of the one-year probation period of graduates. But the forms and contents of these documents are excessively diverse. They are drawn up by whoever can do it, frequently not only not taking into account, but not even knowing the needs of the VUZes. The time has come to develop a unified form for such reports which completely corresponds to the requirements placed by scientific and technical progress on the modern specialist," asserts A. S. Osintsev. It would seem that something has been done here. The Main Administration for Technical VUZes of the RSFSR instructed 20 VUZes to form creative groups made up of leading scholars in order to develop unified formalized criteria for evaluating the work of the higher educational institution as a whole and the quality of training of specialists in particular.

"But it is also necessary to increase the rights of the VUZ, say, to recall its graduates from jobs that do not correspond to the engineering education or even from enterprises if they are not able to grant them actual engineering work," Yu. M. Solomentsev formulates the opinion of many.

The introduction of economic mechanisms for managing the higher school requires a revision of its structure and the elimination of departmental separation of VUZes. Cost accounting relations among institutes and enterprises under the jurisdiction of a single ministry cannot be effective since they do not provide for their being basically independent in nature. Significant reasons will always be found for redistributing money from the training into the production sphere. On the other hand, the development of cost-accounting relations requires a unification of the efforts of training institutions in order to create inter-VUZ faculties, laboratories and computer centers. Many problems related to this cannot be resolved until the VUZes are included on different ("state" and "branch") balances.

#### How To Train New Specialists?

The rector of Mosstankin, Yu. M. Solomentsev, suggests utilizing the module principle more actively. This institute has formulated a module (necessary and adequate selection of specialties and specializations) that is adequate to the structure of the problem being resolved (the creation of automated productions in machine building) and to a considerable degree encompasses all subject issues related to it. With a comprehensive approach to the scientific and technical problem, one cannot consider an individual specialty without its being linked closely to others in the given module. The VUZ could formulate several such modules depending on the complexity of problems being resolved.

The training plans and programs for new courses in Mosstankin are also oriented toward solving a long-range problem. For example, the training plan for the specialty "Technology of Machine Building, Metal-Cutting Tools and Instruments," includes, in addition to traditional disciplines, subjects related to the presentation of the fundamentals of the application of modern computer equipment, automation of production processes, SAPR of technological processes and equipment. All-encompassing training on computer equipment has been provided successfully from the first through the last course. This makes it possible to conduct course and diploma planning on the basis of SAPR and to conduct specialized courses in the faculties with this profile on a high mathematical level.

The list of specialties and specializations that exist at the present time is sufficient for providing personnel for the autonomous components of the SAPR. But not a single one of the traditional groups of specialists is oriented toward the creation of an integrated automated system out of these components. Mosstankin has set the task of giving all future specialists knowledge in the area of SAPR, and some of them--the users (they are the majority) must develop the ability to work using means of SAPR and know their capabilities, while others--developers (system technicians) must be given profound knowledge of the development and construction of integrated systems of automation.

The training plan has a stronger cycle of disciplines related to control of production processes since a successful solution to practically any scientific and technical problem in machine building, in the final analysis, amounts to control of these processes at all the hierarchical levels (machine--section--shop--plant).

The rapid rates of scientific and technical progress also require efficient, flexible training of new specialists. "In order to provide this," thinks Yu. M. Solomentsev, "it is necessary to have basic physics-mathematics and computer (using electronic computers) training of students from the first through the last course, and also the construction of special disciplines on a good theoretical basis. It is precisely a profound knowledge of theory that makes it possible for the specialists to master the apparatus for modeling in all stages of the creation and manufacture of machines and become grounded in the utilization of the apparatus for automated planning. An extremely essential part of even the crucial training material offered in the first course turns out to be unnecessary by the time the student is preparing to obtain a diploma. Therefore it is necessary to teach students methods of solving engineering and scientific problems and not construct a training process using prepared formulas with previously known answers. Any class, laboratory work, or course planning should be organized in such a way that they are small research projects with their own task, methods of solution and conclusions. Such an approach also helps to instill in the future engineers a desire for constant improvement and self-education."

It is undoubtedly important to train students in the general methodological approach to creating new technological processes and machines and to make it possible even in the VUZ to get on a "first-name" basis with computers and automated systems for control and planning. But here it would be good not to forget the good old methods of training which develop imagination and intelligence, strengthen the memory, and instill a love of labor and a readiness to create with one's own hands. Without these the bright hopes of being able to use computers and microprocessing equipment will not be justified.

More and more people are advocating the expediency of two-stage engineering training. It is apparently necessary to change over to such training gradually, initially in a couple of large industrial centers. One of the varieties of training in stages is proposed by the rector of the Tomsk Polytechnical Institute, doctor of technical sciences, Prof I. P. Chuchalin. Within this same 6-year training period, in his opinion, it would be good to introduce another level, that is, to have a scheme of "2+2+2." The first 2 years would provide general theoretical training in the basic subjects of an engineering and technical profile and whatever it is necessary to form a Marxist-Leninist world view. In addition to this the students would obtain one of the working professions in the chosen specialty. The VUZ already has experience in providing working skills. After the first cycle of training the students would be certified and receive a diploma for the basic specialized education and a certificate that they had mastered the skill category in a labor occupation. Then some of them would continue training and some would be sent out into the national economy to the work positions. The proportions would be determined according to the capabilities and needs for specialists in various categories. As a result of the second 2-year cycle of training the students would be given the qualifications of an engineer with a broad profile in the selected sphere of activity, and then a new certification and distribution. The strongest students would train for another 2 years for scientific research activity. The graduates of the first 2 cycles could

continue to study after having worked in production and successfully taken the corresponding examinations.

The experience of the deputy director of the Karaganda Metallurgical Combine, M. M. Mayzholov, convinced him that it is not enough to give the students a labor occupation during the first 2 years of training and it would be desired to introduce the "practice of management" into subsequent courses. During this time each student would be obligated to work as a substitute for a brigade leader, foreman, shift chief and only after this could he be allowed to defend his diploma project.

N. P. Belous suggests introducing mandatory engineering laboratory practice for students at enterprises once or twice a week; leading specialists of enterprises should be enlisted more actively for conducting practical classes in special subjects, delivering lectures on their application at a given plant, and giving quizzes and examinations on them.

There is a current need to introduce positions of private docents and private professors who could be elected by secret vote of councils of institutes from the ranks of highly qualified production specialists and especially distinguished instructors without scholarly degrees. This would make it possible to reinforce the special faculties with real specialists who know the demands of production and would provide incentives for training and educational work of the instructors," Yu. V. Sobolev is convinced.

Beginning with the 1986-1987 school year, the Moscow Chemical-Techological Institute plans to introduce instead of the previous production practices a unified half-year practice session with work in work positions and in engineering and technical positions with a study of certain subjects using the evening form of training. The goal is to instill in future specialists the ability to intelligently apply the theoretical knowledge they have obtained and the skills of organizational work in the collective.

In order to raise the level of practical training of students, in certain VIUZes, in the opinion of Yu. V. Sobolev, it would be expedient to introduce as an experiment a mixed system of training: during the first 3 years one could basically provide theoretical training during day school, and in the next 2-3 years--special training by correspondence. After successful completion of the theoretical training, the student would be sent to his work assignment. The work in production should be a constituent part of the training and be accompanied by the mastery of labor and technical specialties necessary for becoming a specialist, say, an engineer-mechanic for steam engines--this is a fitter in a steam engine depot or at a plant, an assistant machine operator and a foreman. Such a system organically includes branches of faculty, laboratories and experimental shops and the performance of special course and diploma projects upon assignments from production. The students would be interested both in serious study of special disciplines and in effective work in production since not only their "qualitative" success, but also their further success in production would depend on this. Then there would be an essential increase in the labor contribution of youth to the solutions to national economic problems.

There are many suggestions. Some of them have already proved to be viable while others are in need of careful experimental testing. For it is known that any changes made in the system of education involve millions of people one way or another. In all the suggestions one can see a desire to change the existing situation. There is the hope that as a result of the restructuring of higher education for which we are preparing there will be an essential strengthening of general scientific and vocational training of specialists, and higher education itself will be brought into line with the needs of the modern stage of the country's development.

#### FOOTNOTES

1. Armenskiy, Ye., "To Be Able or Not Be Able," PRAVDA, 5 July 1985.

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## TRAINING COMPLEX ORIENTED TOWARD FUTURE

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 148-155

[Article by G. S. Migirenko, Lenin Prize winner, doctor of technical sciences, head of the Department of Theoretical Mathematics and Resistance of Materials of the Novosibirsk Electrical Equipment Institute: "UNPK--Orientation Toward the Future"]

### [Text] Mutual Interest

The so-called "average" engineers who are supposed to fit into any position are not needed by anyone any more. But specialists who have adapted to one kind and one rhythm of production are not needed either. They must be prepared for a rapid change in technologies and assortment of products that are produced within a branch or a specific area. For example, when developing an automated processing center it is necessary to be able, on the one hand, to combine within it a set of technologies which correspond to items that are essentially the same but differ in design and, on the other hand, within certain time intervals to rearrange the shop or the automatic line for the manufacture of different products. Both are regarded as flexible production. In these conditions it is necessary to combine a broad profile of training with the concrete function of the engineer.

Today we speak not about improving existing technologies or partially modernizing machines and equipment thus producing changes in results that are measured in percentages, but about changing over to principally new technological processes and the latest generations of technical equipment which decisively transform production, increasing labor productivity many times over and considerably improving the quality of products. An important role in carrying out this complicated task is assigned to the organizational forms of combining science, production and personnel training. One of these is the association on a contractual basis of the VUZ (VUZes), academic and branch scientific research institutes and enterprises, that is the scientific production training complex (UNPK).

The need for close contact between production and scientific research institutes and VUZes is now recognized by scientists, production workers and educators. But, as our experience has shown, the need for stable ties among

higher educational institutions and academic scientific research institutes is perceived as being less obvious. Let us pay special attention to this.

Academic scientific research institutes, as a rule, determine the level of modern science. If a VUZ interacts with research science which draws the horizons of future production, students become familiar with this by participating in joint development. The students have the opportunity to gain scientific practice and see how research ideas are transformed into applied ones, and they will develop habits and a desire to research for themselves and generate new ideas. When learning design in a VUZ and undergoing design practice in a design bureau or at an enterprise, the future engineer connects ideas with their transformation into mechanisms and machines.

Nor should one forget about the fact that intensive study of educators in modern science which accompanies academic research helps to master more deeply the subject that is being taught and to develop creative forces. This cannot but be reflected in the students' mastery of the course and their activity. It is impossible to educate a creator without being a creator.

Moreover, in the higher educational institutions the departments are frequently headed by docents and candidates, and there are not enough doctors or sciences. Scientific research institutes will help to overcome this difficulty by transferring certain scholars to the VUZ and as a result of joint training of doctoral candidates who participate in general scientific research.

Indeed, scientific activity in VUZes is important in and of itself. For about half of the country's scientific research potential is concentrated in them. Whether this half is "only a number, or also ability" depends essentially on the success of combining research and application. We are speaking about research on large scientific problems (and not minor subjects) and obtaining results that revolutionize production. Large problems are usually complex. At the source of them is the Academy of Sciences, and the main channel should be the branches of the national economy. Excluding VUZ science from the tributaries of this river would cause severe harm both to science itself and to the training of future specialists. About 25-30 years ago, when the country was gathering force in key areas, this happened: many scientist-instructors transferred to academic and certain branch scientific research institutes. It would now be good to rectify this situation.

But it is not only the higher educational institutions that can no longer do without cooperation with scientific research institutes. Scientific research institutes are no less interested in appropriate augmentation with skilled personnel. They are also trying not to have their head in the clouds and keep up with production practice, to search for both the most tempting and the completely realistic. In and of itself, communication between scientists of scientific research institutes and VUZes (common themes, seminars, articles, inventions and so forth) alleviates their one-sidedness: scientists of academies of sciences, as a rule, engage in research of new areas in science, and scientists from VUZes are drawn more to applied developments. The presidium of the USSR Academy of Sciences and the RSFSR Ministry of Higher and Secondary Specialized Education have adopted a decision concerning the

creation of academic laboratories at the VUZes of Russia (laboratories of academic institutes). Thus the Academy of Sciences will transfer some of its developments to higher educational institutions and augment them with instructors, graduate students and students. The results are being introduced jointly.

One of these laboratories (for creating means of transportation for Siberia and the Far East) was opened up by the Institute of Theoretical and Applied Mechanics (ITPM) of the Siberian Branch of the USSR Academy of Sciences as a part of the scientific research sector of the Novosibirsk Electrical Equipment Institute (NETI). It develops universal hydrofoil equipment and pneumatic transportation which are critically needed for the creation of a mobile enterprise for laying main petroleum and gas lines year-round. The idea of pneumatic travel [footnote 1] came to the NETI from the Institute of Theoretical and Applied Mechanics. But it is a long way from idea to embodiment. It was necessary to combine the efforts of workers of several faculties, to create students design bureaus, to enlist the Novosibirsk Aviation Plant imeni V. P. Chkalov and Glavyumentruboprovodstroy, to organize planning developments and so forth. The cooperation produced fruitful results, in particular, five developments for roadless transportation and vibration protection were sent by the Presidium of the Siberian Branch of the USSR Academy of Sciences to the RSFSR and USSR Gosplans.

Continuing the conversation about mutual interest in contacts between VUZes and scientific research institutes, one must note that there is a good deal of advantage from joint utilization of experimental and production bases of institutes, including in the training process, and also from increasing the qualifications of laboratory assistance of institutes and preparing graduate students and engineers to take candidates' examinations.

Higher educational institutions are keenly interested in close ties not only with scientific organizations and enterprises, but also with schools. Indeed it is possible to strengthen interrelations with academic and branch scientific research institutes, design bureaus and plants but select as students young people who are weak and do not have the proper convictions. From these you reap what you sow. But, unfortunately, they can be found studying in practically every VUZ. Neither science nor ties with production can attract such students and their points will never be more than average. They cannot be expelled, and one does not wish to keep them.... A tested form of work of VUZes with school children which makes it possible to become acquainted with the future students ahead of time in order to determine their inclinations, the depth of their knowledge and their exact orientation are 2-year groups for various disciplines. They are being opened up at the VUZ, in the schools or in houses of culture. They are conducted, as a rule, by graduate students.

Thus three of the most important equally significant channels of communication and interaction are formed around the higher educational institution: science, production and the school. To be sure, in practice the school is still not present in clear form in this sequence. But, in our opinion, this is a matter of time.

## Not Interaction on Paper

Several UNPK's have been in operation in the Novosibirsk Electrical Equipment Institute for several years. Some were formed by interested ministries and departments, for example, the RSFSR Ministry of Higher and Secondary Specialized Education (NETI), the Novosibirsk Aviation Plant imeni V. P. Chkalov, and the Siberian Branch of the USSR Academy of Sciences (Institute of Theoretical and Applied Mechanics). The agreement, among other things, envisions additional construction of work areas in the VUZ and the financing by interested ministries. In other cases they have joined together organizations that have the same scientific and practical tasks which need young engineers in closely related specialties. These include also the UNPK which was formed by our faculty of theoretical mechanics and resistance of materials.

It included the Institute of Theoretical and Applied Mechanics and the Institute of Mining of the Siberian Branch of the USSR Academy of Sciences, the Institute of Machine Science imeni A. A. Blagonravov of the USSR Academy of Sciences, Institute of Problems of Durability of the UkrSSR Academy of Sciences, the NETI, the Novosibirsk Electrical Equipment Institute for Communications, the Novosibirsk Institute of Rail Transportation Engineers, the Novosibirsk State University, the MVTU imeni M. E. Bauman, Glavyumentruboprovodstroy, the Novosibirsk and Irkutsk Aviation Plants, the Novosibirsk Plant for Textile Machine Building and others. The purpose of this complex was to improve the training of engineers, to conduct joint scientific research and to introduce its results at the given enterprises.

The agreement concerning the UNPK is essentially different from previous individual agreements. The main thing in it is the unified chain of ties from the Academy of Sciences through the VUZes to the enterprises, and the interests of individual organizations are not broken up as is frequently the case in individual agreements, but, on the contrary, they are concentrated. All partners in the complex, participating in sequential stages of scientific research (right down to introduction of its results into production) help the VUZes to train specialists of a broad profile in keeping with the needs of the group of enterprises.

The creation of a scientific production training complex requires certain efforts. First, it is necessary to select organizations that actually do have common goals. These are selected by the VUZ-coordinator. Second, it is necessary to concretize the tasks through the schedules for interaction that are drawn up by each participant in the complex. Third, they create a scientific and technical council that supervises the fulfillment of the schedules for interaction. The agreement and the schedules are approved by the top managers of the participating organizations.

Let us give a couple of examples of interaction among partners in our UNPK. Lectures on problems of future problems have been delivered and are being delivered to the students by scientists of the Siberian branch. For instance, Academician N. N. Yanenko discussed new areas of computer mathematics, a corresponding member of the USSR Academy of Sciences N. N. Zheltukhin--the future of aviation, and Academician Ye. I Shemyakin--modern tasks of machine

building. During 1982-1985 a total of more than 25 eminent scientists delivered lectures. It is also important that they lectures were being delivered to instructors at the same time.

Our students take practical training in the laboratories of the institutes of the Siberian branch. Scientists consult with them on diploma projects and some graduates are even assigned here. The programs of courses offered in the NETI are coordinated with the scientific research institute. Moreover, the Institute of Theoretical and Applied Mechanics of the Siberian Branch of the USSR Academy of Sciences has opened up a branch of the faculty of aerodynamics, and the same thing is true in the special design bureau for hydraulic impulse equipment.

The leading specialists included in the UNPK of the enterprises tell the students about problems of introduction and utilization of new technical equipment and technology. Meetings are organized with production leaders. For VUZes that are partners in the complex it has become customary to have general conferences in which there is a lively discussion of the essential scientific problems and an exchange of positive experience. But the main direction for the interaction is joint utilization of computers in training. In developing the agreement concerning the UNPK the VUZes concluded a separate agreement concerning collective utilization of the experimental basis of each of them. There is no doubt that this is having a positive effect on the training and scientific processes.

One of the kinds of activity of participants in the complex is educational work with students. It is done, in particular, doing practical work and in student scientific-production detachments, which are distinguished from student construction detachments. In the construction detachments the students engage in construction work on orders from outside organizations without any connection to scientific or training activity of the given VUZ, and sometimes they are of the nature of a "dowry," and the quality is not always high, although on the whole this is a good thing. In our opinion, it is precisely the students' scientific research institute that should be the basic direction for the activity of student detachments. The nature of the labor here is engineering, especially when it comes to introducing developments on which the students have worked along with scientists and instructors. Such a scientific production detachment participated, for example, in the planning, construction and testing of hydrofoil equipment at the Aviation Plant imeni V. P. Chkalov. Similar work was done also by six other student design bureaus and scientific production detachments that were created in the faculty of theoretical mechanics and resistance of materials.

All four scientific research institutes included in our complex are linked to the NETI by economic and budget agreements as well. Four of these agreements have been concluded with the institute of theoretical and applied mechanics alone. The following are working on creation of vibration equipment and vibration protection under programs of the USSR State Committee for Science and Technology and the USSR Academy of Sciences: the Institute of Machine Science imeni A. A. Blagonravov, the NETI, the Novosibirsk Electrical Equipment Institute for communications and the Novosibirsk Institute of Rail Transportation Engineers, and also the MVIU imeni N. E. Bauman. Under the

"Siberia" program non-road transportation is being created by the NETI, the MVTU imeni N. E. Bauman, the ITPM, the Institute of Mining, Glavyumentruboprovodstroy and the Aviation Plant imeni V. P. Chkalov. Workers in our faculty have defended doctoral and candidate's dissertations in scholar councils of the Siberian Branch of the USSR Academy of Sciences and they have extensive publications and inventions, including certificates of industrial models of nonroad transportation. Recently the director of the Institute of Machine Science imeni A. A. Blagonrabov, Academician K. B. Frolov sent blueprints for vibration protection seating for combine operators that was developed by the NETI, the Novosibirsk Electrical Equipment Institute for Communications and the IMASH to be introduced on Don-1500 and Yenisey-1200 combines.

The scientific production training complexes are in need of further improvement. In particular, it would be good to create at the enterprises sectors for plant design bureaus, laboratories or groups for joint delivery and introduction of scientific developments of scientific research institutes and VUZes. Our faculty has already organized five of these laboratories. One of the most successful ones is in operation at the Novosibirsk Production Association Tyazhstankogidropress. There workers of the faculty, the design bureau of the association and students from the student design bureau are working on planning and constructing an automated processing center. Under the leadership of engineers and scientists, the students are developing individual components of the center (these are diploma projects) and in the association's design bureau they are undergoing prediploma practice and are being assigned to the same place. During the summer they will be formed into students scientific production detachments. Thus they are combining planning and construction of an automated processing center in the training of personnel for its operation.

The interaction between science and production, unfortunately, is still frequently carried out mainly "through paper" and hence the formalism. As our experience has shown, the UNPK can become a link between public and private interest, a connection directly through people, as it were, "animated interaction." It is hardly necessary to prove that such an approach will produce greater results.

#### FOOTNOTES

1. Migirenko, G. S., "Transportation of the Future Begins in Siberia," EKO, No 4, 1983.

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## PROS AND CONS OF SPECIALIZATION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 155-159

[Article by V. I. Livshits, candidate of technical sciences, Tomsk Polytechnical Institute: "The Thorny Path of Specialization and Its Offspring"]

[Text] The machine-building faculty of the Tomsk Polytechnical Institute (TPI) has for many years now been training engineer-mechanic-technologists, designers and line managers. But there is also an innovation: in 1985 for the first time in the institute's history 47 robot technologists were certified with the specialization "Technology of Robotized Production" in the traditional specialty 0501, "Technology of Machine Building, Metal Cutting Machine Tools and Instruments." Possibly this event would not deserve special attention if it had not been preceded by more than 10 years of persistent work to establish a methodological and material base for the new specialization and to obtain official recognition from the USSR Ministry of Higher and Secondary Specialized Education.

Unfortunately, this specialization is far from the only one with such problems and it is not the only one that has had to travel such a long path. New equipment and new technology appear in production much earlier than they are reflected in the training plants and programs. The mechanism for arranging the regulation documents of the Ministry of Higher and Secondary Specialized Education for the Modern Level of Science and Technology is still not mobile or flexible enough.

As early as the end of the 1960's we machine building workers of the TPI faculty became aware of the need for advanced plants, above all aviation plants, and technologists of a qualitatively new type (programming technologists for machine tools with numerical program control). We developed a special training plan with which we offered to train them, but we did not manage to get it approved in the Ministry of Higher and Secondary Specialized Education. The ministry did not consider it necessary to introduce any gradations within the specialty 0501 under the pretext that it provides for broad training of engineers and encompasses basically all of the production duties which the graduates can encounter in the plant. Although the real reason for this position was perhaps something different: everything depended

on the stubbornness of the State Committee for Labor and Social Problems which did not consider it necessary to differentiate the wages of technologists who were already working and those who had just completed the VUZ.

Relations of enthusiasts of the new specialization also turned out to be difficult within the institute, with workers of other faculties that graduate specialists in electronics, computer equipment, automation equipment and automation. "There are plenty of traditional technologists, and your training is only an embellishment for them. The consumers would be glad to accept the specialists even without your decorations," we were told by adherents of the traditional direction. This was a significant argument because the "former" technologists were asked for again and again by plant representatives.

Regardless of how the passions may have flared up among the faculties concerning this issue, the managers of the TPI always supported the new profile of training for technologists. Machine tools with numerical program control had already appeared at Tomsk Plants. At conferences in the party obkom and gorkom the rector and pro-rector frequently had occasion to hear reproaches directed against them from directors of enterprises because the institute was not satisfying the demands of the region for new specialists. On his own authority the rector permitted the machine tool building faculty to train technologists in the new profile on the basis of an individual training plan.

Our technologists, who are trained "semilegally," work successfully in leading plants for flexible automation of mechanical processing. With time many began to recognize the inevitability of this kind of automation. More and more specially trained personnel were required. The consumers began to put more and more pressure on the Ministry of Higher and Secondary Specialized Education. In March 1981 it finally officially recognized the specialization "technology of robotized production." Let us repeat that this took more than 10 years.

How are our graduates working out as engineers? In various ways. From rapid, successful advancement along the job ladder to bitter disenchantment, a decline into nihilism, and departure from the plant at their own request. Our analysis showed that their fates, like litmus, reflect various attitudes toward flexible automation of production.

Let us take two specific plants. They will recognize themselves, but let us call them conventionally "Progressist" and "Konservator."

In the vanguard is Progressist, a plant that is actively introducing GAP [flexible automated production]. It is the base enterprise for training new technologists and it has organized there a branch of our faculty called "Automation and Robotization of Machine Building," which was created in 1983 after the specialty was officially recognized. Naturally, at this enterprise our graduates are rated highly and have excellent opportunities for professional growth. The prevailing atmosphere here is one of creative engineering labor and its return is high. Good knowledge of system technology of automated machine building enables the robot technologists to take the lead in the collective.

At the other extreme is Konservator, a plant which arranges its work for many years of freezing of the renewal of output. As the specialists assert, this enterprise continues to produce 40-year-old products. Because of its comfortable existence which is based on mass reproduction of yesterday's products, the plant builds adequate housing. This attracts many specialists, for today up to 40 percent of the VUZ graduates are family people who have children. Konservator each year receives up to 20 technologists (traditional and in the new specializations). As a rule, they are assigned to positions as line managers of production in shops which at the given enterprise have no time for scientific and technical progress, and the plan reigns supreme there.

Here is a fairly typical situation for this plant. After a certain amount of time a young engineer has a suggestion for modernizing equipment, rearranging production or facilitating the heavy manual labor of workers, which he takes to the shop management, the technical services and the party committee. "If all this were done, anyone could produce a plan without any special effort. You are the leader of the collective, so go ahead and achieve the goal through increased educational work. And if you cannot do this it means that you are not trained to manage people very well at the Tomsk Polytechnical Institute," the engineer hears the fairly widespread answer of former managers.

The situation is no better in the engineering services of Konservator, where mainly women are working now. The creative enthusiasm of youth is not evaluated here either, and the only thing that is encouraged is efficiency and high productivity. If a young engineer does not have this, again complaints are cast out against the institute that has trained the incompetent specialists.

The destinies of our graduates at Konservator fall into three patterns: some, not wanting to put up with the uncreative nature of the work, go as technologists, designers and production leaders to other enterprises, including outside the city; others, disenchanted and professionally disqualified, change not only their place of work, but also their profession; still others adapt to the situation.

A clear example of the third type is the destiny of the TPI graduate Boris V. A talented student, by the time he had graduated from the institute he had become a good professional and an enthusiast of flexible automated production. But he was unable to be assigned to an enterprise where they were actively updating production because it could not provide him and his family with housing. Because of housing he went to Konservator to the division for mechanization and automation. From year to year the managers only promised him that he could work only with machine tools with numerical program control. Boris had hoped to work in this area. After 4 years of work at the plant, no longer believing in these promises, he changed over to other work in the scientific research subdivision of Progressist.

But after a month he wanted to go back. His years of work at Konservator had not passed without a trace: Boris had become accustomed to "lazy" technology, less mobile activity, and the lesser degree of intensiveness of uncreative labor. And in places where they create new technical equipment and technology

for flexible automation they work differently: with enthusiasm, considerable intellectual expenditures in order to solve significant problems, high mobility, and a daily struggle for the advancement of their development. Since the new technologies are adjusted on the machine tools which are busy all week long with work for the plan, it is necessary to work on Saturday and Sunday, and frequently also during the night shift. "At this plant after 17 hours I completely forget about production," said Boris V., "but at your plant I dreamed at night about the task on which I was working during the day." The spiral of his engineering destiny ended with his return to Konservator.

Such cases with talented young engineers, unfortunately, are not very rare. Many of our graduates who are filled with creative fervor and hopes for active work on the revolutionizing production, having been cooled by the reality of today's enterprises. When you meet such graduates after 5 years you see that they have accumulated enough solidity and grounding in reality, but they have lost forever their spirit of militancy and dynamism. Perhaps these are the most dangerous and sensitive losses not only for them, but also for the society.

It is especially wasteful when outstanding, talented young engineers are brought to this condition. As a rule, they comprise 15-20 percent of the annual graduation class of new technologists. We are using an individual approach in training them and receiving good results. Here is only one of many examples. The graduates of 1982 Ye. Veryaskin, A. Samuylov and A. Zotov in 3 months, using separate machine tools with numerical program control and outdated control devices and a not especially high-quality industrial robot, created and put into operation a robot technological module for center lathe work which has an original design and components. Specialists have recognized this work as a record in terms of the level of development and the time period for realization.

Trying to maintain the high creative potential of such engineers, the scientific and technical council, under the Tomsk Party Gorkom, suggested creating at the TPI a city center for robotization of production. By concentrating strong specialists here, it could engage in complicated problems of robotization of various technologies of machine and instrument building. But the excellent idea was not realized. The problem was the majority of individually trained specialists were not from Tomsk, and they were critically in need of housing. This problem could not be resolved either by the institute or by the city.... Not very many local residents go to the Tomsk Polytechnical Institute and it is not the best of them who are prepared to continue their education. Here one can see the effect of the low prestige of the occupations of technologists and designers. It would be good to accompany the revision of priorities in favor of machine building and production with a similar process in higher technical education.

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## PRESTIGE OF CONSUMER SERVICES CONSIDERED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 160-168

[Article by A. G. Petrov (Moscow): "Does a Barber Need Scissors?"]

[Text] Raising the material and cultural level of the life of the population and satisfying their growing needs for goods and services constitute a program requirement of the party. The comprehensive program for the development of the production of consumer goods and the sphere of services during 1986-2000 has set large tasks for accelerated development of branches specializing in consumer services, the strengthening of their material and technical base, and their provision with equipment, materials and batching items. These unified requirements are met in extremely different ways in various branches and with respect to various commodities....

The question asked in the title may seem rhetorical to the reader. But in fact what is a barber without scissors? Absurd! Even in the distant future it is somehow awkward to imagine a barber without this plain instrument. Could the fashion change so rapidly that the only implementing of labor for the master would be the electric clippers which cut all hair in the same way....

But still our question is not an idle one. Because today domestic industry does not produce either scissors or any other professional instrument for the barber. I learned of this when I had occasion to speak with one Moscow master. I was very surprised and decided to check on it. In the RSFSR Ministry of Consumer Services they confirmed: local industry produces a few, true, but they are of such poor quality that it is practically impossible to work with them.

Then where, one might ask, does one obtain the instrument with which they cut our hair? A good one, that is, from firms that are well-known in the world, is obtained under the counter. And now many are importing these--it is an advantageous business.

I must admit that when I went to the international exhibit entitled Interbytmash-85, which was passing through Moscow and where they demonstrated the latest innovations in municipal and consumer service equipment, I expected to see among the domestic exhibits a suitable set of equipment for barbers! But, alas! I never did find one. From which I drew the conclusion that, as usual, nobody has any intention of taking this matter seriously and so our barbers will have to continue in the future to take care of themselves. The chief of the technical administration of the RSFSR Ministry of Consumer Services, Ye. S. Grigoryev, who accompanied me to the exhibition, did not undertake to dispute this conclusion.

It is striking! In the Russian Federation alone there are almost 160,000 barbers who are known to be deprived of the necessary implements of labor--and this is considered a normal phenomenon. This fact is fairly clear, but it is only one of the many manifestations of the long-ingrained attitude on the part of planning agencies and "large" industry toward consumer services and its needs in the area of material and technical supply as a branch with very little significance. I was convinced of this again when after the exhibition I went to the RSFSR Ministry of Consumer Services and became acquainted with certain documents there.

The first governmental decree devoted to providing consumer services with modern equipment, including instruments for barbers, was enacted almost 20 years ago, immediately after the republic ministry was formed. The last one was at the beginning of 1983. In particular, point 22 of this decree of the CPSU Central Committee and the USSR Council of Ministers, "On Measures for Further Development and Improvement of Consumer Services," said: "To provide during 1984-1985 for the manufacture (annual) for the basic requirements of the RSFSR Ministry of Consumer Services instruments and other necessities for barbers." The executive agencies--the RSFSR Ministry of Local Industry (scissors, razors, and so forth), the USSR Ministry of the Chemical Industry, the USSR Ministry of Light Industry, the USSR Ministry of Instrument Making, Automation Equipment and Control Systems, the USSR Ministry of the Fertilizer Industry and the Latvian Ministry of Local Industry.

But even this decree did not improve the situation of the barbers. The aforementioned ministries actually ignored it. In vain the Ministry of Consumer Services pestered them, wrote numerous letters, and held joint conferences. In vain it appealed to the USSR Gosplan, sending them information each quarter about failure to fulfill assignments. Everything was in vain. "As of 6 January 1985 the ministries responsible for doing the work did not completely fulfill a single one of the assignments set for producing barber equipment and accessories," stated the minister of the consumer services of the RSFSR, I. G. Dudenkov, in his letter to the USSR Council of Ministers. There he also spoke about the general "serious arrears in the fulfillment of the decree concerning the development and creation of new models with equipment for consumer services, which significantly influences the technical supply for the branch."

Will this appeal to the higher level help? From conversations with specialists it became clear to me that these barber scissors are not at all

such a simple thing as they appear to be at first glance. The grade of steel, the degree of its tempering, the angle of the cutting edge, the profile of the surfaces of the "two ends" and the means of fastening them—many things have to be mastered before one obtains a good instrument. For many years the RSFSR Ministry of Local Industry was not able to cope with this task. And they do not even know how to begin to produce thinning scissors and razors. This is why the consumer service workers tried when preparing the last decree to change the executor and enlist the Ministry of the Machine Tool and Tool Building Industry in this matter. And when nothing came of that they decided to put their supplier in contact with one of the foreign firms which was willing to agree to cooperation. But so far not much has been achieved here either.

The low level of reliability of instruments and equipment used in consumer services is a serious problem. Take the photographic equipment with which the masters work in the photo shops. They are also intended for amateur photography and in 3 months of continuous operation they break down. And there is so much trouble involved with such a service as processing film and making prints! And all because there is a critical shortage of good, reliable equipment.

Here it is obvious that it is time to make a small digression and explain something to the readers so that this will not be interpreted incorrectly. These remarks are certainly not intended to be "Pictures at an Exhibition," an immense number of which I am not discussing at all. I am speaking about domestic technical equipment for consumer services and comparing it with existing standards. We are still waiting for our consumer services to provide for a radical improvement in the quality of services it offers. But what kind of material and technical base is there for this? This is a most important question and it would be correct to expect that the answer may come from an exhibition.

In the opinion of specialists, the technical level of domestic consumer service equipment on the whole has risen appreciably since 1976, when the last Interbytmash exhibition was held in our country. Ye. S. Grigoryev even thinks that this time the foreign firms did not offer any principally new solutions which were unknown to us. To be sure, they are following a course toward automation of technological processes, computerization, reduction of the material- and energy-intensiveness of equipment, and also the creation of technical equipment and instruments for home service.

But still, although our industry has taken an unquestionable step forward, the state of affairs continues to be alarming. To be sure, many of our developments presented at the exhibition were as good as the foreign ones in terms of their basic parameters. But, as a rule, they were individual models which have not yet appeared in the branch. For instance, the multi-operational sewing machine of Class 2022, which is capable of making two kinds of stitches and performing several dozen operations, is on a completely modern level. A most necessary machine! But during the 7 years of its assimilation the Ministry of Light and the Food Industry has managed to manufacture only three models. Why?

"They say that they have their own development which is better," Ye. S. Grigoryev answered my question. "Well, but up to this point we have none at all. And we are completely unable to deliver them. They also produce another excellent machine in a very limited quantity--of Class 426. Incidentally, several years ago both of them were awarded gold medals at the Exhibition of the Achievements of the USSR National Economy. In general, when dealing with the Ministry of Light and the Food Industry, on whom we depend most for technical support, our relations are difficult. For instance, we developed our own electric steam generator with a productivity of 45 kilograms of steam per hour--twice as much as that of existing ones, including foreign ones. The unit is extremely necessary--for dry cleaning and sewing enterprises. We produced it and brought it to the exhibition. We suggested that the Ministry of Light and the Food Industry produce it, but it refused. Moreover, in the long-range plan for up to the year 2000 they included a machine producing...30 kilograms of steam, but it was 'their own.' And just yesterday it had not even been developed. The Gosplan has not supported us either: 'The manufacturer will not agree.'"

Subsequently in the RSFSR Ministry of Consumer Services I came across a curious document. In July of 1985 this ministry had approached the Ministry of Light and the Food Industry with a draft of a joint order entitled "On Measures for Raising the Technical Level of Technological Equipment for Consumer Service Enterprises...", which included concrete suggestions for developing new technical equipment, modernizing existing equipment and removing obsolete equipment from production. The answer, which was signed by Deputy Minister G. I. Kurganov, was brief: the Ministry of Light and the Food Industry "considers the publication of such an order inexpedient at the present time." And that was it.

Now about "expediency." It was sad to see how sharp the contrast was at the exhibition of machines for express repair of footwear produced by the Ministry of Light and the Food Industry and foreign models. Even purely in terms of external appearance our machines, which were of various sizes, various colors and manufactured by various plants, took a back seat to the bright, beautiful imported models. But the technical inferiority was much more serious. The OM2-R finishing machine manufactured by the Gribanov Machine-Building Plant even had to be removed from the exposition--its technical level was too terrible.

Of course we must admit that our industry has been engaged in the production of technical equipment for consumer services for only 20 years and therefore the degree to which it lags behind the best foreign models can be explained. But even 20 years, honestly speaking, is a significant period of time. What then is the main reason? It lies primarily in the attitude of machine-building ministries and planning agencies toward the needs of this branch. Today its need for specialized equipment is satisfied by only 30 percent. Far from the best enterprises and materials are usually allotted for filling orders from consumer service workers. Under these conditions even good engineering and design solutions cannot be realized in the form in which the developers conceived them.

And there are some other domestic exhibits: large washing machines (for loads of 50 and 100 kilograms). In terms of the technical ideas on which they are built they are in no way inferior to foreign analogues. But they are bulkier and noisier. It was explained to us: this is because the engines, the automation equipment and the other batching items which the designers included in the machines were not made available to us and we have to be satisfied with second-rate items--ones that would not be offered to the "excellent" branches. Recently the developers of this equipment were told to refrain from using non-rusting metal. They must replace it with ferrous metal that is coated. But it is extremely difficult to make this coating durable. It is no accident that in the advertising for washing machine equipment the basic merit that is noted is that non-rusting steel is used--a guarantee of durability.

And so, if one is to speak directly, the main lesson of the exhibition is that there is a critical need for a radical restructuring the entire system of technical equipment for the branch that engages in consumer service for the population. Its national economic status should be fundamentally changed. There should be a psychological change. We can in no way overcome the many years of inertia in perceiving consumer services as something secondary unless significant. True, for many years almost all the funds were invested in heavy industry. But that was justified.

Times are different now. The country has accumulated an immense economic potential. And the retarded development of the sphere of services is being increasingly reflected on the development of the entire national economy. But, as before, consumer services is not perceived as a branch of the national economy. Even though it is extremely profitable with correct organization of labor and, as practice shows, expenditures are recouped with interest. A ruble invested here produces a ruble and a half in return, which is quite comparable with the most profitable production. And the annual volume of sales of services in the RSFSR Ministry of Consumer Services alone amounts to 4.1 billion rubles, of which 3.3 billion are so-called "spending" money, which goes back into circulation.

It is precisely the rapid turnover of money and consumer services, from which (along with that obtained in trade) all budget payments are made, that conditions the special role of this branch in the national economy and, at the same time, in the sphere of consumption. The policy of increasing wages and real incomes of the population aggravates the problem of providing goods and services to equal the growing mass of money. The shortage of both has led to a situation where now a colossal sum of money is taken out of circulation and being saved up by the population. And here also there has been a sharp reduction of the "alcohol" recently. One of the most important means of eliminating the disproportions that are arising should be accelerated development of the service industry, which can be achieved only on the basis of the achievements of scientific and technical progress in the branch and extensive introduction of modern technical equipment and technology.

Attention should probably be given to the proposal to create a union consumer service ministry--both in order to improve the status of the branch and in order to make it possible to conduct a unified technical policy in it. It is hardly rational that today each republic ministry of consumer services spends

money on the development, ordering and manufacturing of the same "mechanical assistants," when this could be done centrally, without unnecessary duplication. Another fundamental problem which requires an immediate solution is the satisfaction of the needs of the branch for specialized equipment. With time the need for this will increase because of the development of in-home services, particularly, those that are performed in the home of the client, which requires compact, multifunctional portable equipment.

But am I not breaking down a door that is already open? After all, they have adopted the Comprehensive Program for the Development of the Production of Consumer Goods and the Sphere of Services during 1986-2000. Even its very appearance--with the status of the national economic level--shows the significance that the party and government attach to the development of these branches. True, there is a program. But this is only the beginning of the large amount of very difficult work which will have to be done. Therefore, this is the time to think about how to carry out what has been earmarked. Nothing will be done automatically, in and of itself--we know of examples of good programs which were never carried out and many good decrees which were never implemented. In particular, the one concerning providing this same consumer services with modern equipment.

It is necessary to take into account the lessons of the past when creating organizational support for a program that has been adopted. And in the logic of things the client with the corresponding rights and economic levers of influence, the main distributor of resources, should be the Ministry of Consumer Services. Otherwise we shall not achieve the required turnabout in the satisfaction of the growing needs of the workers for paid services. And then the barbers will never acquire good scissors....

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## WAYS OF ECONOMIZING ON MATERIALS INDICATED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 169-176

[Article by R. L. Snejchnoy, doctor of technical sciences, and M. V. Mikhaylyk, candidate of technical sciences, Scientific Research Institute of Special Methods of Casting (Odessa): "Where Does Winged Metal Fly?"

[Text] The Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up to the Year 2000 noted the importance of improving the structure and quality of design materials based on tasks for creating progressive new technical equipment and following resource-saving directions in the development of the economy and the development of the production of economical kinds of products. Creating and applying aluminum alloys in machine building and increasing the output of aluminum at more rapid rates correspond to the solution to these problems.

During the 1920's, before the organization of the aluminum industry, the country purchased from abroad the initial aluminum for manufacturing mainly castings and also for rolled metal for aircraft construction. Much has changed since that time: we have aluminum plants in operation which satisfy the country's need for "wing" metal. But, in our opinion, it is not utilized and distributed among the branches as well as it could be.

In certain branches of machine building the weight of blank pieces with complex configurations is reduced to one-third, and expenditures of fuel and expenditures on metal processing are reduced. The utilization of primary aluminum in the construction industry, which now consumes a considerable proportion of it, reduces the time period for constructing objects. Scientists are proposing more and more new and nontraditional spheres for the application of "wing" metal (see, for example, the article by Academician A. Belov, "Aluminum for the Agroindustrial Complex," NAUKA I ZHIZN, No 4, 1984). Many branches of the national economy have a critical need for it. But even now, in our opinion, much could be done if the existing resources of aluminum and aluminum alloys were distributed efficiently.

As an example, let us just list certain items on which aluminum is utilized inefficiently to replace ferrous metals or other materials. In the construction of industrial and trade buildings, in the Ukraine and Belorussia

large quantities of primary aluminum are used for window openings, doors, stained glass windows, ceilings and other construction elements. We are increasing the output of large profiles of aluminum alloys to replace steel ones for bearing elements of buildings. On the streets of Moscow they have conducted a "large-scale operation" for replacing the taxi phone booths that were made of ferrous metals with new elements manufactured from rolled primary aluminum alloys. On the streets and in the parts of the Ukraine (particularly in Odessa and the health resort of Mirgorod) they have installed a large number of urns, benches and information road signs that are manufactured from high-quality aluminum alloys. Perhaps all this is more aesthetically pleasing, but how economical is this what we consider to be mass squandering of rolled aluminum?

But the reserves for machine tool building are even greater. There rolled aluminum is used for manufacturing complicated and important parts of pneumatic distributors, diamond polishing rings and so forth. With mechanical processing of parts, 700-800 kilograms out of every ton of primary aluminum go to waste. Why does this happen? The USSR Ministry of Nonferrous Metallurgy produces rolled aluminum with large right-angle and other sections, which makes it impossible to manufacture economical shaped parts for machine building.

At the same time in the aluminum subbranch itself, there is a persistent tendency to reduce the output of primary aluminum. Without sufficient justification, in our opinion, at the Bratsk, Krasnoyarsk, Ural and Volgograd aluminum plants they have reduced the output of ingots made of primary alloys. At these enterprises the traditional technology of melting aluminum into small ingot molds has been replaced by casting round and flat larger ingots, weighting 5 tons and more (for obtaining rolled metal). Two large specialized plants have been constructed and begun to produce aluminum construction materials for the USSR Ministry of Installation and Heavy Specialized Construction Work and the Moscow Gorispolkom. New plants are being constructed in Khabarovsk, Leningrad and Kiev.

One can understand the position of the USSR Ministry of Nonferrous Metallurgy: it is considerably easier to produce metal for enterprises of the construction industry. The latter are willing to use rolled aluminum without making any special requirements on its chemical or physical properties. The machine builders need metal of strictly determined qualities.

And so such examples make one wonder whether or not it is necessary to accelerate the production of primary aluminum alloys? Perhaps it would be more expedient to improve the structure of consumption? But one thing is completely clear. The complicated task of optimizing the production and consumption of aluminum, whose volumes predetermine in a decisive way the output of electric energy in the country, can be expediently carried out by using advanced domestic and foreign experience in obtaining the maximum return from this metal with minimal expenditures of it.

The key to the solution to this problem is provided in the decree adopted in June 1981 by the CPSU Central Committee and the USSR Council of Ministers, "On Stepping Up Work for Economy and Efficient Utilization of Raw Material, Fuel-

Energy and Other Material Resources." To implement this decree in the practice of machine building means to increase the output of high-quality primary and secondary aluminum alloys which make it possible to improve the technological structure of the consumption of metal in the leading branches of machine building.

During the past decade, there has been an appreciable increase in the proportion of consumption of cast aluminum in automotive construction and agricultural machine building. The increase in capacity and the reduction of the expenditure of fuel in means of transportation has required a reduction of the mass of the engines and mechanisms as a result of changing the designs of parts and utilizing lighter alloys. The reduction of the mass of shaped parts was achieved through using alloys instead of iron and using progressive technology for the production of blank pieces.

Many years of practice in the production of parts made out of aluminum alloys on highly productive equipment instead of castings from iron at the Altay Engine Plant have confirmed the high effectiveness of the technology of casting in metal forms. The work done by specialists of the NIISL, other institutes and the plant has received a high rating in this country and abroad.

Scientific and technical progress in the production of blank pieces in the modern stage in our country and abroad have been directed toward maximum application of aluminum alloys and more competitive technologies--casting under pressure and also casting under low pressure. Thus, for example, with casting under pressure one obtains the most precise masses of the casting and the coefficient of the utilization of metal is 0.91-0.99. Here expenditures on mechanical processing of the blank pieces are minimal. But, in spite of the annual increases achieved in the country in castings from aluminum alloys (9 percent) and castings under pressure (12 percent), the proportion of castings made of nonferrous metal alloys in the overall output of castings is still inadequate and is just a fraction of the necessary level.

Practice shows that the existing restrictions in the selection of the best grades of alloys (primary cast aluminum) in the stage of designing parts have become an impediment in the output of castings made under pressure and the entire production of nonferrous metal casting in the country. Under these conditions it is impossible to reach the world level, according to which castings made of aluminum alloys manufactured under pressure comprise half of the overall output of these castings. But because of the shortage of ingots made of primary aluminum at enterprises of domestic machine building the proportion of the output of blank pieces through casting under pressure is about half of what it is in the United States and Italy. The consumption of primary aluminum, for example, in the United States is 78-80 percent higher, and in Western European countries it is even higher than that. Moreover, it is typical of many developed countries to increase the proportion of the output of aluminum alloys cast under pressure and also those cast under low pressure to replace cast iron. Thus in the United States the proportion of aluminum alloys cast under pressure increased during 1970-1975 1.6-fold, and during 1980-1985 (estimate)--1.8-fold. Moreover, in the United States, for example, the consumption of aluminum in construction elements is decreasing.

In foreign countries and, to a lesser degree, in our country, in capital construction there is rapid development of light construction elements made of metals less costly than aluminums. As the experience of Hungary and other countries shows, in the construction of buildings made of light elements they use primarily thin sheet steel (in construction in the United States the thickness of the sheet is 6.35 millimeters and less).

For purposes of optimizing the structure of domestic metallurgical production in the future, on an assignment from the Presidium of the USSR Academy of Sciences, the State Committee for Science and Technology and the USSR Gosstroy, we have created a problem commission under the leadership of the president of the UkrSSR Academy of Sciences, Academician B. Ye. Paton. With the participation of the leading institutes in the country, including the NIISL, it has developed well-grounded proposals for reducing the consumption of rolled ferrous metals for shaped items obtained by mechanical processing and approximately doubling the proportion of the consumption of aluminum alloys for these parts.

Questions of improving the structure of the production and consumption of aluminum were discussed at the All-Union Scientific and Technical Conference on the Acceleration of Technical Progress in the Aluminum Industry, which was held in Moscow in 1984. The speeches emphasized the need to increase the consumption of aluminum and its alloys in machine building. Additionally, in the paper of a specialist from the Ministry of the Automotive Industry he noted the expediency of accelerated development of the production of rolled aluminum for the construction industry. The consumers of primary aluminum should be mainly machine-building enterprises that produce complicated (shaped) blank pieces. But these questions were not properly evaluated in the decisions of the conference. The recommendations that were adopted envision a change in the structure of the production and consumption of aluminum in one direction: increasing the amount of rolled metal and reducing the amounts of castings in billets. In our opinion, this is a half-measure.

In our opinion, it would be expedient for the State Committee for Science and Technology in conjunction with the USSR Gosplan to develop a more efficient structure for the construction of aluminum by the leading branches of machine building and other branches of the national economy through redistributing capital funds expended on the development of enterprises that produce semi-manufactured aluminum products and rolled aluminum, metal-cutting machine tools, instruments and fittings, in favor of reduction of cast nonferrous metal for machine building.

Significant reserves for reducing the metal-intensiveness of blank pieces can be found in domestic machine tool building--a branch with many products (there are about 150,000 kinds of cast pieces alone) with an annual output of from dozens to several millions of blank pieces, predominantly series-produced blank pieces with small masses. In the branch (as noted) high-quality cast aluminum alloys are not being applied sufficiently. For this reason, in the structure of metals consumed by machine tool building, the proportion of cast pieces made of nonferrous metal alloys is one-half to one-tenth that in other basic branches and is one of the lowest in machine building.

Designers of the design bureau and the plants, when designing complex and simple parts with small masses, select grades of metal and cast pieces which are available at the material-technical and procurement base of the enterprise. Since in metallurgical (casting) production there are no reserve capacities, the solution is found in the application of cast steel pieces with subsequently mechanical processing. Intensive application of cast steel pieces, and sometimes cast iron, for parts with small masses has been the reason for the inefficient structure of the production of blanks for various kinds of alloys and methods of molding them not only in the branch, but also in the country as a whole. Therefore in mechanical processing shops there is an increased proportion of machine tools that cut and remove shavings and, correspondingly, a reduction in the proportion of finishing equipment (polishing, finishing). Because of the imperfection of the investment structure for the development of capacities for producing blank pieces made of nonferrous and ferrous metallurgies in machine tool building, for example, the coefficient of the utilization of rolled ferrous metals ranges from 0.4 to 0.55; rolled aluminum alloys--from 0.22 to 0.34; and cast aluminum alloys--from 0.67 to 0.92.

It seems to us that machine tool builders should think about more extensive application of light alloys.

Thus under the conditions of the Ministry of the Machine Tool and Tool Building Industry (Shilutskiy Gidroprivod Plant, the Moscow Pneumoapparat Production Association, the Simferopol Pneumatic Equipment Plant, the Nikolayev Production Association for producing lubrication equipment and so forth) the changeover of a number of parts to a technology of manufacture using casting of aluminum alloys under pressure, under low pressure and in metal molds we provide for a reduction of the mass to one-third to one-fifth, the labor-intensiveness of mechanical processing--one-half to one-third, and it would reduce the number of machine tool workers to several dozen.

But further development of the production of cast pieces using more competitive technologies in machine tool building and branches of machine building is impeded by the shortage of primary materials, and on the whole funds for cast aluminum are distributed mainly to mass consumers, including those whose products do not contribute to the development of technical progress (recall the examples at the beginning of the article).

The national economy would gain a great advantage if the USSR Ministry of Nonferrous Metallurgy would extensively utilize foreign and domestic (automotive construction, agricultural machine building) experience in the output of special aluminum alloys for casting under pressure.

The experience of the United States, the FRG and other countries shows that the organization of concentrated metallurgical production of castings made of nonferrous metals and above all aluminum alloys through casting under pressure is an objective process in the intensification of machine building. The recommended productions, which are called "Tsvenolit," can be designed and constructed analogously to the way this was done for plants for producing billets made of iron and steel castings, welded elements, forged and stamped

pieces (Tsentrrolit, Tsentrosvar and Tsentrokuz). During the past 30 years we have put about 2 dozen of these plants into operation. The capacity of each of them is from 30,000 to 200,000 tons of blank pieces per year. A large proportion of these plants are under the jurisdiction of machine tool building. Yet during this same period our country has not created a single (except for a couple of plants in automotive construction) specialized plant for producing cast pieces made of nonferrous metals which are necessary for manufacturing products for general machine building application. Moreover, the level of technology, automation, organization of labor, culture of production and quality of cast pieces at these plants is considerably higher than in the production of blank pieces made of ferrous metals. Large "Svetrolits" create real conditions for eliminating unprofitable smaller productions of blank pieces.

We also need more purposive work for accounting for and gathering scrap metal and waste from nonferrous metals, and also applying (instead of physical tons) better evaluation indicators for the work of metallurgical production at the level of the enterprise and branch.

The organization of the production of high-quality cast aluminum alloys and the creation of modern equipment with technological means of ASU TP and also specialized plans for producing cast pieces from nonferrous alloys will make it possible in the next decade to satisfy the needs of machine building for cast pieces whose geometry is as close as possible to the parts and to raise the technical level of production and increase the proportion of cast pieces made of nonferrous metals, including casting under pressure, to the level of the industrially developed foreign countries.

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## PAYMENT FOR AUTOMATION WORK EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 177-180

[Article by N. B. Mikulin and N. S. Polyakov, Lenelektronmash NPO (Leningrad): "Norm Setting for the Labor of SAPR Developers and Improvement of Their Pay"]

[Text] Since 1985 we have been working under the conditions of the experiment for improving wages for scientific and engineering-technical personnel. The experiments encompass the majority of subdepartments of the association.

Our department is developing a system of automated planning and individual subsystems and components of the SAPR. On the whole the department is performing individual kinds of both experimental design work and scientific research work, and the associates have to engage in all the traditional stages of planning. How has the experiment been reflected in the various constituent parts of the activity of the developers? Is it possible to speak about making the department's creative work more active?

There is not a single one of the workers today, from those who actually do the work to the managers of the subdepartments, who has any doubt about the progressiveness of changing over to the new system of wages: with a marked increase in the products list and a certain increase in the volumes of work, the number of personnel in the departments has decreased by 4, and during the entire period of the experiment there has not been a single case of failure to meet the planned deadlines for the work. The management has in its hands a powerful economic lever which makes it possible, on the one hand, materially (through the system of coefficients of labor participation--and morally) to stimulate the activity of the workers. On the other hand, because of the immediate filling in of the work sheets and personal accounts, it has become possible to keep track of the fulfillment of the thematic plan.

Under the conditions of the experiment economic interest has been regulated by the personal contribution of the worker, and when the coefficients of labor participation were calculated the following were taken into account: promptness, intensiveness and quality of work, labor and production discipline and the worker's creative contribution. Through combining occupations and performing a larger volume of work it became possible to pay increments to wages, and their overall amount was 4,200 rubles. The differentiation of the

payment for the researchers and developers were manifested in the increments to the wages, and their amount depended on the salaries. The amount of the increment ranged from 20 to 150 rubles per month.

It would seem that everything is contributing to the main goal of conducting the experiment: increasing the responsibility of the workers for the technical level and quality of the developments and strengthening their interest in performing a larger volume of work with fewer people. But a number of problems appeared, and effective utilization of what had been achieved was impossible unless they were solved.

In the chain "association-division-department-laboratory," only at the first two levels of the organizational management is cost accounting in effect: neither the department nor the laboratory is a cost-accounting unit. Is there any interest on the part of the department, and within the framework of the department, the laboratory, in adopting a more difficult plan and mobilizing its resources? The strictly "local" economic interests of these subdivisions orients them neither toward adopting more difficult planning assignments nor toward overfulfilling them.

The main source of incentive under the conditions for the experiment was savings on the wage fund which was determined as to the difference between its base fund (taking into account the sum of money paid for temporary disability during the past 3 years) and the amount actually expended. Within the framework of the annual planning the base wage fund was established and could be adjusted in the direction of reduction or increase only for the next year. Under these conditions the growth of the fund from economizing on wages was basically determined not by the growth of the actual labor expenditures, but by the reduction of the number of workers in the department.

In spite of the fact that the increase of the planned wage fund is determined by the percentage of increase in the actual volumes of work, accepting larger volumes is impeded by the following: - "Truncated" cost accounting does not give the department clear reference points regarding their own labor expenditures; there is no confidence in the stability of the normatives for increasing the wage fund for each percentage of increase in the volume of output; in the division up to this point the principle of planning "from the level achieved" has been in effect. Even with overfulfillment of the planning assignments with the fewer number of workers, the management of the department has no guarantee that the current table of distribution of workers will remain in effect.

The coordination of the experiment with new subject matter that has not been developed previously has not been sufficiently worked out. For departments engaged in the development and introduction of new technical solutions (particularly new program means) have ended up in worse conditions than those departments engaged in the introduction of standard or partially standard planning solutions. While requiring great labor expenditures and involving a certain amount of risk concerning the introduction of SAPR (including seven constituent parts), the new subject matter is reflected negatively in the fund of economizing on wages and, consequently, on the amount of increments to wages of individual workers.

The departments can have "easy" plans and not be given incentives for new subject matter only when there are no stable, scientifically substantiated normatives. And indeed the normatives for the fulfillment of the planned subject matter for individual subsystems and components of the SAPR were changed three times during the period of the experiment, and for a number of subjects and stages the normatives diverged from the volume indicators. All this impeded the substantiation and the possibility of paying increments to the workers.

What are the limits of norm setting for evaluating labor expenditures? What is the level of reliability of norm setting and where is the limit on expenditures for developing norms? The first thing that meets the eye is the creation of new subdivisions in the association for purposes of organizing norm setting. Their assignment is to organize norm setting. This practically nullifies the effect from releasing workers in the functional departments. The second thing is detailization of norm setting, which entails detailization of the technologies of individual planning jobs. The normatives developed recently which envision periods of several hours for each technological operation are not very different from norm setting, for example, for machine tool work. This is wrong in principle, since the result of the work in this case is not a unit product, but a plan (rough plan, sketch, technical plan, working plan). The final result is the introduction of this plan.

In our opinion, it is expedient to attach the norm setting for scientific research and experimental design work only to consolidated elements of the technological process--such as the technical assignment, the technical plan, the working plan and so forth. Then, on the one hand, it will not be necessary to enlist an excessively large number of workers for the "needs" of norm setting for labor and, on the other hand, the managers will be relieved of the endless coordinations of normatives that are constantly being refined; they will be able to engage in their basic work.

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## EFFICIENCY OF INSTRUCTIONS QUESTIONED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 180-183

[Article by N. P. Chushkov, head bookkeeper of the Primorzoloto Association (Khabarovsk): "The Prospector Artel and Instructions"]

[Text] At the April (1985) Plenum of the CPSU Central Committee M. S. Gorbachev said: "It is necessary to sharply limit the number of instructions, provisions and methods which sometimes, by interpreting party and government decisions in their own way, hamper the independence of the enterprises." The editorial staff hopes to show in its articles how sometimes the instructions undermine the essence of decisions of government agencies.

In 1984 the USSR Council of Ministers adopted the decree, "On Measures for Improving the Activity of Artels of Prospectors." The fact that we extract some of our valuable metals and certain other minerals by the prospector method is generally known. But the financial side of the activity of these artels is a detail that is not very well known but is of extreme importance. In our association we have 12 artels of prospectors. The USSR Council of Ministers has approved new regulations for the artel and established that the Gosbank must grant credit for up to 80 percent of the volume of planned extraction of metal during the forthcoming season (and this production is only seasonal, during the summer period). According to the new regulations the prospector artel has the right to "acquire under the established policy from enterprises, organizations and institutions the equipment, machines and mechanisms that are to be written off as well as above-normative and unutilized material values, and also purchase on credit foodstuffs, supplies, cultural goods, special clothing, bedding, auxiliary materials, forage and other property if these kinds of products for production and technical services and consumer goods cannot be offered by the mining enterprise with which the artel has contractual relations."

Everything would seem to be clear. But, for example, the USSR Gosbank entered Point 150 of its instructions No 1 11 years ago and this point has not changed to this very day. According to it the aforementioned "up to 80 percent" is

divided into two parts: monetary expenditures of the artel and material expenditures of the mining enterprise. At first glance there is nothing contradictory here.

In a letter of 24 February 1984, that is, 2 months before the adoption of the governmental decree, the USSR Gosbank clarified what the monetary expenditures of the artel are: wages for prospectors, deductions for social security, expenditures on business travel, maintenance of offices and expenditures on ink and copying paper. That is all!

Excuse me, but what happened to Point 14 of the new regulations for the artel where it speaks not about wages and ink, but about equipment and materials? We have asked the USSR Gosbank this question four times already, beginning in October 1984. To our first two letters the deputy chief of the administration of credit for the metallurgical and chemical industry of the board of the USSR Gosbank and then the chief himself answered that they would not grant credit for acquiring these material values.

The association has not received an answer to the third letter which was addressed directly to the chairman of the board of the USSR Gosbank. And yet we asked a direct question: where will the artels get the money to exercise the rights granted to them by Point 14 of the regulations? In our opinion, there can be only one answer: Gosbank credit. There are no other sources.

Apparently there are two paths: either pay for material values acquired by the artel on the side, from a running account of the association and obtain credit for them as material expenditures of the mining enterprise, or grant the enterprise the right to determine for itself how much credit the artel can be granted from the special loan account for expenditures made directly by the artel itself.

As of today the Gosbank does not wish to consider this question at all. The essence of the considerations of workers in the Khabarovskiy Kray Gosbank office are these: since the artels acquire material values from the outside, let them pay for them themselves, and we do not care where they get the money. It has never occurred to the Gosbank that in such cases the artel uses for this purpose part of the wages for the work day. If, for example, it is 30 rubles, today the artel pays the prospector an advance of 10 rubles and spends the remaining 20 rubles on acquiring materials and spare parts.

By the end of the season the majority of the artels are in a situation where, because of the material expenditures made for the next year's season, there is clearly not enough money in the running account to settle with the members of the artel. As a result, the final settlement is postponed until January-February and sometimes even until March of the next year, that is, it is made from credit for the following season.

This is what happens to the first part of the 80 percent for the season for extracting metal. And what about the second part? The expenditures of the mining enterprise itself? Not much better. In the same Instructions No 1 it says that the Gosbank issues the additional credit once a month according to the balance. For instance, the balance for the current month will be for the

20-24th of the following month. But what is used for expenditures up until the 24th of the following months? The Gosbank has no answer. There is a solution: it is necessary to grant credit according to interim information from the mining enterprise, say, every 10 days. But this is not legal. Today they are in a good mood and they can accept information for 10-day periods. Tomorrow their mood has turned sour and one has to wait for the monthly balance. And now, when the monthly balances have been abolished, what next: wait for the quarterly ones?

Thus the Gosbank has not drawn the proper conclusions from the decree of the USSR Council of Ministers concerning the improvement of the activity of artels adopted in 1984, has not changed its instructions and, it seems, does not intend to change them. And yet the artel form is a part of brigade organization of labor. It should be supported and developed, and no artificial barrier should be created against it.

From the editorial staff: According to information as of the beginning of 1986 there have been no changes for the better. As a result of this attitude on the part of the USSR Gosbank toward extending credit for the prospector method of extracting metal, the Primorzholoto Association has been denied all kinds of credit by the Khabarovskiy Kray Gosbank office since November 1985, credit is not even being granted for the association's direct expenditures, and it cannot pay the artels (read, people) about 5 million rubles. And this means that the artels will settle accounts with their workers from credit for 1986 up until March and later.

Unfortunately, the publication of this article can do little to help the author: he submitted his resignation since, as he wrote us, "I am tired of this struggle where the game is played on only one side." Then we were informed of his death. But perhaps the publication will be of some use to those who have come to replace him.

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## NUMBER OF REPAIR PLANTS QUESTIONED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 183-184

[Article by A. I. Kurtov, shop chief of the Novosibirsk Energy Mechanics Plant: "Do We Not Have Too Many Repair Plants"]

[Text] Plants for capital repair of construction machines, as a rule, are under the jurisdiction of construction ministries. Unfortunately, they have begun to be created randomly. They are organized near large construction facilities and have the basic goal of providing capital repair for machines and mechanisms for the needs of construction, but after the completion of the construction of the facilities they continue to operate. This leads to the appearance of several plants for capital repair of the same machines in one region. Thus in one of the regions of Novosibirsk there are two plants for capital repair of tractors from the Chelyabinsk Tractor Plant. One belongs to the Ministry of Power and Electrification and the other to the Ministry of Transport Construction. But another plant has been created whose program envisions the repair of those same tractors from the Chelyabinsk Tractor Plant.

As a rule, all repair and mechanics plants work with machines of the most diverse makes. Additionally, they are partially occupied by manufacturing certain other products, that is, they are being transformed into multipurpose enterprises. Hence the low effectiveness of production, as a result of which their existence becomes economically inexpedient.

Today, when the question of accelerating the country's socioeconomic development has become so crucial and there is an additional need for resources for conducting technical reequipment of the majority of machine-building plants, is the very best time to "part ways" with plants for capital repair of machines and to take measures for specializing them.

Carrying out a particular specialization of repair plants is the first stage on the path to increasing their effectiveness and on the path to improving the quality of the repair of machines, but this does not exhaust all the reserves for their capital repair.

The following comprehensive program is needed:

1. To conduct an inventory of all repair plants in the country.
2. To develop a program of specialization of these plants, taking into account their location in the various regions, but not taking into account the departments to which they belong.
3. To develop a program for transferring repair plants for manufacturing plants. Capital repair of machines in the future should be organized and carried out by the manufacturing plant.

The system whereby capital repair of machines, units and components are done by the manufacturing plants creates the possibility of having reliable information about the design and operational qualities of the machine; to correctly plan the production of spare parts and have spare part bases that are centralized in the various regions; and to conduct testing of design changes and their modernization in the process of capital repair.

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## EXPENSES IN DESIGN BUREAU RECOUNTED

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 185-191

[Article by V. A. Sakharov (Moscow): "The Ruble That Is Numbered But Not Accounted For"]

[Text] An operations meeting is in process. The chief of the planning department is routinely grumbling that subdivisions of the design bureau are not fulfilling financial plans uniformly: during the first month--almost nothing, during the first semester--a minimum, the basic fulfillment--during the last month of the third quarter and during the fourth quarter.

The chiefs of the departments are moaning, they are blaming objective difficulties....

One of them unexpectedly suggests:

"But what if the work were reported not monthly, but once a quarter?" his voice was trembling from timid hope.

"I could agree to that," I answered, "but with one condition: If you obtain written agreement from each member of the trade union to receive wages only once a quarter."

The efficiency expert's face turned sour.

"Is it really incomprehensible," I added, "that our wages are formed from the results of our labor?"

From the faces I could see that this was not comprehensible. Everyone was firmly convinced: regardless of how you work, you go up to the cashier and there what you have coming to you is waiting. And where it comes from is not important. The state is rich.

But then when it comes to personal interest, then my designers become uncompromising and uncorruptible.

In the design bureau they filled out a document for issuing incentive remunerations for inventions. The inventors ran to the bookkeeping office. And there they said: "There is no money." "What do you mean, there is no money?" the creators retorted. "After all, the estimates envision incentive remunerations in the amount of 3,000 rubles," they present the paper they had saved.

"In January how many orders from clients did your department fill?" the head bookkeeper asked and then answered for himself: "None! And in February nothing. So what is there to pay you with?"

"But then what are our reports for?" the inventors are surprised. "After all, here in the estimate: 3,000...."

"The estimate itself means nothing if there is no money in the cash register," explained the head bookkeeper. "After all, money for incentive remunerations is formed from the sums obtained by the design bureau from the clients. Can you really not understand this?"

But our creators cannot understand such intricacies of bookkeeping.

I looked over the estimates assigned by the departments for the manufacture of experimental models at the experimental plant of our association. I looked and I was amazed: the threading of several hundred screws cost as much as gold watches, and the manufacture of the simplest stamp had the cost of the latest model of Zhiguli.

I called in the department chief, who had signed the calculations.

"Do you really agree with these wild calculations? Can you really not see that the cost has been increased by several magnitudes?"

"I can see, of course," my interlocutor agreed unwilling. "But after all, we can pay--we have the money...."

Would he have thought that way if the money had been his?

It is easy for us to sign an expense account to pay for interurban telephone negotiations among workers who have not checked to make sure that they were correct, and we can certify a trip ticket for a driver of a truck who says that he has worked two shifts when he has actually only worked on, and we can write off state property that someone has damaged without exacting a single kopeck from the guilty party.

But what if all this were out of our own pocket?

One must say that the organizations are not only not interested in economizing, but sometimes, because of the existing instructions, protocols and paragraphs, they are forced to conceal savings that have been made.

If you do not spend the wage fund they cut it. If you do not fill in the staff they remove the vacancies.

This is the way it is in our design bureau as well. When any subject that is financed from a centralized fund is completed for a cost less than that envisioned in the estimate we are threatened with being blamed for failure to fulfill the plan. The fact is that then the main administration fails to utilize all the funds allotted to it, which means that they will be withheld the next year. And nobody is interested in the fact that the design bureau has fulfilled the plan for the volume of contracted work. This, you see, is another item....

The imperfect system of planning combined with laziness and the inefficiency of the bureaucratic apparatus which includes people who do not wish to redistribute funds, leads to a squandering of state money. As a result, we frequently sign carelessly balanced reports and imaginary estimates.

It should be noted that recently economic incentives for labor, including in scientific research institutes and design bureaus, have become considerably more active. But in solving many problems, as before, one can see a desire for unjustified restrictions. Thus, for example, in keeping with the latest documents, bonuses for workers of enterprises and associations are paid out of the economic incentive funds (FES) which are created from profit formed in production. But the expenditure of the FES funds is strictly regulated: it is determined ahead of time which percentage the organization should spend on social and cultural measures, which on especially important assignments or material assistance.... But why not give the collective the right to dispose of its own funds which it has earned and determine how to use them in the way that suits them best?

It is known that experiments conducted in the country make it possible to solve the problem of unnecessary restrictions. But when will these changes make their way to the scientific research institutes and design bureaus? We should like for it to be as quickly as possible!

One more aspect. Since 1986 the scientific research institutes and design bureaus have changed over to a new system of payment for the labor of scientific workers, designers and technologists. For the design bureaus it envisions an expansion of the "spread" of wages of the four categories of workers--from sector chiefs to designers and technologists of the third categories. For some reason they have forgotten about those who are "below" and "above" them. As a results, workers such as technicians, senior technicians and so forth have wages on the same low level, while the salaries of the aforementioned four categories have approached the rates of the department chief, the head engineer and even the director which, as we know, have remain unchanged. It seems to us that this situation reduces the effectiveness of the entire measure.

Not a single manager has yet managed for a long enough period of time to stay within the bed of procrustes of the limits allowed for administrative and management personnel.

The miserliness of the established wages, especially for "low-level" workers, has become the talk of the town. Let us compare two excerpts.

The first is from the book "The Secretary of the Institution" (Moscow, "Ekonomika", 1983, p 60).

"The Duties of the Secretary:

"1. Composing letters, preparing brief references from reports, and so forth.

• • •

"4. Keeping the manager's diary; organizing his meetings and confirming negotiations; helping the manager in planning his work day.

"5. Organizing business trips for the manager and preparing routes and programs for these trips.

• • •

"7. Organization and participation in the work of conferences, including preparing the agenda and keeping the minutes.

"8. Organizing business in the manager's office, that is, keeping up and promptly changing posted schedules, checking on documents and files that are stored in the office."

The second excerpt is from Decree No 1058, from the appendix "Salaries of Employees and Junior Service Personnel":

"Secretary-typist: 80, 85 rubles."

The disparity is obvious.

There are doubts about the point according to which a number of administrative and management workers of branches and divisions of design and planning organizations, including directors and head engineers, receive wages that are 10 percent less than received by people in the same position in the main organization. If one takes into account that in terms of the volume of work and the number of personnel the branch is frequently as important as the head institute or design bureau and its personnel have equal functions, the situation seems absurd.

What self-respecting specialist will go to work as a head bookkeeper or chief of a planning department in a branch design bureau for a salary of 150 rubles? And this is in an organization of the first category, which designs especially complicated products.

Do you know what "snowdrop" flowers are? This is what they call bookkeepers who are occupying the position of a foreman, secretaries who are counted as engineers, cleaning ladies who are documented as technicians, and so forth.

How come these flowers blossomed with such luxuriant color at these plants and in the scientific research institutes, in the streetcar and trolley fleets and

design bureaus. One of the reasons lies concealed in an ancient triad: inadequate wages, personnel shortage--limitation on combining jobs.

It is impossible to understand why one cannot permit scientific workers, designers and technologists, after they complete their day of work, to work in their organization as janitors, yardmen and guards. For such a combination of jobs would solve a number of problems. They would be standing in lines to fill these positions!

Another example. Everyone who is familiar with the work of the design bureau knows that the most difficult and fatiguing of all the designer's duties is the work of the controller of technical documentation. This work requires high qualifications and experience and knowledge of technology and equipment, and also of a multitude of standards, technical specifications and other regulation documents.

In spite of the satisfactory wages that are offered (usually from 200 to 230 rubles) it is extremely difficult to find a controller: his work is not considered to be creative and, moreover, it is extremely monotonous. To put it succinctly, this job is not for a young person. The idea emerges of its own accord: to invite pensioners to do this work. They have experience and qualifications and patience....

But the law prohibits pensioners from working in an engineering position while retaining their pension.

Now let us calculate. A pensioner, while retaining the full amount of his pension, agrees to work as a controller with a salary of about 170 rubles. If he receives a pension of 120 rubles, the state pays him a total of 290.

But since this variant is not permitted by law, we (if we are lucky) hire a controller for a minimum salary of 200 rubles while the pensioner who was not given the job continues to receive his 120 rubles as before. The total state expenditures in this case will amount to 320 rubles.

There is a monthly overexpenditure of 30 rubles for each controller!

This is only the financial aspect of the matter. It is difficult to explain why a pensioner can hold a labor position without losing his pension, but not an engineering one. Apparently at one time this problem was approached exclusively from the standpoint of the labor force shortage. But we must not wait until we are in a situation like the one we have with bookkeepers--unable to find them at any cost--and only then permit hiring of pensioners.

One can say with confidence that even in the area of the utilization of the labor of workers far from all reserves have been exhausted. I have an illustration right outside my window.

Our design bureau rents an automobile and a driver from the city passenger transportation office. The established mileage limit is up to 100 kilometers a day. Hence it follows that the driver is not working for a large part of the working day.

I decided to give him work for that time. I filled out the documentation for him to combine his work with a position of a subsidiary worker, which are in short supply, with a salary of 70 rubles a month--loading and unloading experimental models, materials and other cargoes needed by the organization.

You cannot do that--an inspector appeared out of nowhere and forbade it. I understand, he said, that it is a paradox, but according to the law one cannot document a worker to combine jobs during time for which he is receiving wages for his basic work.

And so on the lawn under my window is the driver Vasya--getting some sun. And the cargoes are being dragged around by head designers of projects, leading engineers and other engineers with large salaries. Apparently the main reason for the aforementioned prohibitions and others like them is the fear of abuses. But it is said to admit that unjustified restrictions have entailed a wave of forced violations: after all, one must live, and you will not find cleaning ladies, yard men or guards for the "straight" 70 rubles, and you will not find secretaries for 80, either.

It is probably necessary to entrust more to the manager. The organization should be given a firm plan and general limits on the number of personnel, but the director should be allowed to decide for himself the necessary number of administrative and management personnel. Let he himself and his assistants determine how many head specialists, leading engineers, technicians and so forth he needs in order to fulfill the planned assignments. And he should not be bound by fabricated indicators of the average wage for each position, the ratios among various categories of specialists, and so forth.

Then it will be possible to make the proper demands on him.

I have no doubt that these problems will be resolved sometime and unnecessary restrictions and prohibitions will be removed.

But it should be as quickly as possible--after all, times waits for no man.

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## **PERSONAL WORK ORGANIZATION FACILITATED**

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 212-217

[Article by A. S. Fokeyev, chief of the capital construction department of the Moscow Aviation Plant: "How To Plan Working Time"]

[Text] In the first issue of EKO for 1984 Candidate of Economic Sciences Kh. A. Bekov advised our readers to use a desk/pocket weekly notebook for work notes. The compactness and convenience of this little book was evaluated by industry: the Voskhod firm began to produce one. Today it is already possible to speak about experience with utilizing the weekly notebook. The article published below shows how the weekly notebook organizes and facilitates the labor of the middle-level manager.

Let us say that you are a department chief of a large enterprise. You need to plan your work for the day, week, month, quarter, semester, year and 5-year period. To begin with, let us design the form of the plan. I vote for the weekly notebook produced by the Voskhod firm. Now we must decide how to use this weekly notebook. I suggest making standard forms: weekly-hourly (a copy of the weekly notebook), monthly, quarterly, semi-annual, annual and five-year. I advise beginning with long-range planning and gradually moving down to current planning.

1. The five-year plan. The fewest number of entries will be found here: they have to do only with the five-year plan as a whole. The main thing is to write down the tasks according to the deadlines. Basically these will be deadlines for the beginning and end of certain work, deadlines for reports, drafts of plans for the future five-year plan and so forth. The entries on the standard plan must be broken down for the various years (it is also possible to do it for half-year periods).

2. Annual plan. This is a concrete deciphering of the five-year plan for the given year plus the annual report, annual applications, drafts of plans for the next year, and intermediate deadlines for performing work that is intended for several years, dates of annual conferences and meetings, holidays, various traditional measures and so forth. Certain deadlines can be approximate (give

or take a couple of days) and then they are made more precise when the time comes. The standard plan can be broken down for the various semesters, quarters or even months.

3. Semi-annual plan. 4. Quarterly plan. In principle one can combine the annual, semi-annual and quarterly standard plans, adding the corresponding deadlines for reports, submitting applications and so forth, depending on the specific nature of the work of the manager.

5. Monthly plan. It is not a deciphering of the annual, semi-annual or quarterly standard plans. The monthly standard plan includes only those kinds of work (or measures) and dates for their performance which are repeated from month to month. They include the following work:

for state and departmental provisions--reports, applications, plans and so forth;

for decisions established for the enterprise by the administration and public organizations--conferences, dispatcher hours, committee meetings and so forth;

for your orders in departments under your jurisdiction--summing up results, days of technical information and so forth.

Here one must keep two important aspects in mind. First, by intentionally placing the standard plans one on top of another right down to a particular week, we are always able to determine the list of mandatory business and the amount of time spent on it. Second, it is necessary to decide for ourselves: is each week of the month equally filled with business? Usually the fourth week has more time occupied, and therefore work should be taken away from it.

Weekly-hourly. This is the most difficult standard plan to draw up. Now let us think about how you, a department chief of a large enterprise, spend your working time. The range of your activities is fairly broad: calls to the ministry, the CPSU raykom or ispolkom to office hours for personal problems and work with the mail. In order to bring order into this avalanche of business you decide to divide your working time into two basic groups: occupied and free. You subdivide the occupied time into absolutely occupied and conventionally occupied.

The absolutely occupied hours are those spent on measures where your participation is mandatory. These are dispatcher hours, weekly conferences with the director, meetings of the party committee, work on certain commissions, office hours for personal problems and so forth, including meals.

The conventionally occupied time including those hours with a probability of being called into conference both within the enterprise and in external organizations is the highest. For this it is necessary to know the days and hours of the meetings in other organizations concerning questions in whose resolution you are participating.

For the conventionally occupied time you do not make appointments for any conferences or business meetings. Even if they do not call you in, you can

successfully utilize this time as your free personal time. Usually everyone who plans his time begins with the absolutely occupied time and then goes directly to the free time, and there are few people who devote attention to the conventionally occupied time. And yet this is precisely why measures earmarked for these hours by short-sighted managers are not carried out. I advise you to mark the two kinds of occupied time in different colors--it will be easier to visualize the pages of the weekly notebook.

And so, having separated the occupied time from the overall budget of working time, you can determine the days and hours of free time, that is, the time which you can freely (with the exception of cases that are difficult to predict) dispose of in the interests of the department and job duties. These are the two subgroups into which the free time should be subdivided. Let us call the time for work with the department--regulated free time, and the time for carrying out personal duties--personal free time.

Let us begin with regulated time. Each manager must establish the schedule for work of the subdivision under his jurisdiction. You will agree that the worker is always disciplined by the knowledge of what the manager expects from him and when. I suggest determining the times firmly:

for conferences of the entire department, of one subdivision or of several subdivisions;

for conferences with individual workers for solving a particular range of problems;

for signing business papers requiring the presence of the workers;

for other measures, depending on the specific nature of the work of the subdivision (spur-of-the-moment meetings, 5-minute talks, inspections and so forth);

for office hours for personal problems.

This kind of regulation of the department's work should initially be coordinated with the workers involved (one should not be afraid of this--more democratism makes the execution more mandatory) and only after this can it become directive. The way the link of "manager-performer" works will depend largely on the correct distribution of this subgroup of free time. The situation created in the collective, whether it is efficient or nerve-wracking or, perhaps, even indifferent, also depends on this, which, of course, will reflect the business qualities of the manager. Good business traditions give management work structure and solidity and create a certain psychological mood. It is also desirable to mark regulated free time with a particular color.

After this the little windows of time are left for personal free time. You will probably use this for visiting outside organizations during their office hours, telephone conversations, work with the mail, business games, preparation of papers, reports and so forth. Rest should also be fitted into this time.

And now let us turn back somewhat--to regulated free time. If you legalize the work schedule according to the five points suggested above, this will be your weekly-hourly standard plan. Practice suggests that monthly and weekly-hourly standard plans should always be kept close at hand.

Many people are bothered by the circumstance that the window hours in the weekly notebook are not very large, and you cannot get much done in them. Obviously, in parallel to the weekly ones, one should keep a personal card catalogue of business affairs and also use the departmental card catalogue. Then one can reliably store the entire history of the subject that is being developed. I think that many will agree with me that fairly frequently during the time of working on a subject it is necessary to go through the history of the issue. Therefore in the window hours of the weekly notebook one should make entries like: "Conference on Subject No 6," "Expert Evaluation of Facility A," and so forth, and the essence of the corresponding business should be noted. In this respect the weekly notebook of the Voskhod firm directly causes one to take business correspondence very seriously.

If you have recently been appointed to the position of a chief of a department in which you have not worked previously, do not be in a hurry to regulate everything immediately. Work for 3 or 4 months, as they say, with improvisation--this is necessary in order to discover the various nuances--and then boldly begin to draw up standard plans. The amount of time spent on drawing them up will be recouped 100-fold. By taking advantage of the standard plans you will feel satisfaction from the fact that "burning" affairs have disappeared, the workers have extended themselves in their work, and you yourself have begun to utilize your working time more productively.

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## WORK ON SCIENTIFIC RECOMMENDATIONS SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 10, Oct 86 pp 218-222

[Article by Vladimir Bykov: "Satires and Vignettes"]

[Text] But I gave splendid advice!

They called me into the administration and asked me to give some scientific recommendations. I asked: About what? "About comprehensive improvement of the work of Uncle Vasya. He is obviously worn out. Uncle Vasya has produced exactly half as much as the theory promised."

All right. I studied Uncle Vasya and his immediate surroundings. I suggested that they establish the position of a monitoring supervisor. He would yell and thus stimulate Uncle Vasya.

They did this. He yells. He began to produce a little more, but, naturally, it was not as good. They produce and produce....

They called me in again.

I explained: the controller has a thin little voice and his wages are lower than Uncle Vasya's, can he really be expected to change anything? Of course not, let us put a threatening controller over him. He will stamp his feet and threaten with his cane: I will knock you around, he will say, or I will cut off your legs or I will completely do you in. It will be a warning--and things will start happening.

They did this. He threatens. They begin to produce a little bit better, but naturally it was more expensive. They produce and produce.

They called me in again.

I explained: there are many overhead expenditures. You have to pay the designers, you have to pay the patent experts, you have to pay the programmers, you have to pay the forecasters. And the only one who is actually doing nothing but producing is Uncle Vasya! Reduce the number of those parasites, get rid of every third one--that is the first thing. And

over all of them you should put a head controller--that is the second thing. He will check on all of them and leave them where they should go.

They reduced the number. They put the head controller in charge. They began to produce differently: first a little bit better, then a little bit less, then a little bit worse, then slightly more expensive. First this way, then that, they produce and produce....

Correct. They called me in again. They said, How long are you going to be playing us for fools? What have they instructed you to do?!

I explained: there were separate instructions--separate measures have been created, but a system is needed. We shall form a well-arranged system--and we shall go for broke: from below--controller-supervisors, over them--controller-threateners, on top of all of them--leading controllers, and above them (so that there will be abuses) head controllers, and above all the others the controlissimus. He will not be under anybody's jurisdiction but will just keep an eye out and remove anyone who should be removed.

All right, they said. For the last time. We shall have a system. It promises many good positions.

They constructed the system. One shouts, another stamps his feet and threatens with his cane, a third leads them where they should go, a fourth is in charge of all this and shudders before a fifth, and the controlissimus keeps an eye out and removes....

Well, it came around to me. They saw that I was not doing any good at all, I was just in the way. One!--and I was not longer there.

But in the administration they had not forgotten me, and called me in again. I had nothing left, I had been fired and excluded from everywhere. But I am nobody's fool, and explained everything according to science: I recommended, fellows, only that which you expected of me and no more. It is most charming: to be controllers and to stamp your feet. But there is nowhere for you to go: you have forgotten how to work, but you like to eat high on the hog!

"Your criticism is correct," the people in the administration sighed unexpectedly. "You have nothing to lose, tell us honestly: What should be done?"...

"This," I said, "you should not ask me, but Uncle Vasya. As a working man, he is the only one who knows this. And I will be writing another dissertation about him, so since you have nowhere to go, restore me to my former positions and start listening. For you will never know any other science except that I am irreplaceable!"

#### The Maxwell Equation

"Because of the reform in education, we made the selection much more severe," the rector said proudly. "Everyone who is sent for courses is tested first. Are you curious?"

...There were about 20 people in the auditorium. Almost all of them were slumped over their desks. One was singled out--a tow-headed person with his mouth half open and a perplexed expression in his eyes. And also near the window two people sat and smirked. The rest were diligently writing without raising their heads. The strong dictating voice of the lecturer made its way to their notebooks.

I listened.

"The laws of the dynamics of the electromagnetic field established by Farraday and Maxwell," dictated the lecturer, "under the conditions of the socialist planned economy cannot operate in their initial form. The quantitative changes in the essential links are accumulated and lead to qualitative changes in the action both of individual laws of physics and in their totality...."

"What kind of gibberish is that?" I quietly asked the rector. He lowered his eyes in a satisfied way and nodded toward the exit. Just as quietly as we came in, we slipped out of the auditorium.

"What kind of delirious nonsense is that?" I repeated, closing the door behind me. Why are they writing down that nonsense?..."

"The selection, my friend, the selection," the rector panted, wiping off the sweat. You were hearing the mass testing. Everybody writes down and believes this nonsense. The impressionability is amazing and the independence of thinking is almost nonexistent. If they believe that laws of electrodynamics can be manifested in a changed form, they are even more willing to believe that the laws of economics can change form and be transformed however one wishes, that they can be repealed, amended and abolished. And that is the way they will carry out their business. Did you notice the three who were not writing, but thinking? We shall train them further. The rest we shall return to where they came from, they are inert types and they are hopeless."

"But they are the absolute majority!" I was terrified. "Who will you teach?..."

"That is not altogether true. This is the absolute majority among those selected. This means that those who selected them do not understand modern requirements for personnel either. This means that they too...."

"But they too were promoted and approved by somebody," I observed and began to smile inside, imagining the entire hierarchical pyramid.

"But have no fear about the upper levels!" the rector noted cheerfully, easily guessing my thoughts. "The upper levels have an immense reserve for reinforcement. As we know, the pyramid stands not on a hill of sand, but on a very reliable foundation. It is large and fantastically diverse. From it it is possible to find and select any type of future managers. Select them, train them--and advance them upward. But they must want to. And they must remember that the laws of economics are just as unshakeable as the laws of Maxwell.

## A Couple of Minutes

Why am I eating so rapidly? But I work rapidly, too. Why am I chewing on my napkin? Which napkin? Ah, this one... excuse me, I am in a big hurry. Have you also eaten? Let us go, I shall talk on the way.

Do not be surprised, I work in the Gosbank, and I myself practically am the Gosbank.... You understand, everyone needs money. Everyone! Under current conditions nobody wants to earn all that it takes to support themselves, and so they crowd around the cashiers, waiting for their millions. And note: they do not simply wait, but they are waiting for the next decree that has advantages. But what does this mean, with advantages? Well, in each decree it says that a given organization, enterprise, branch or scientific trend should be given special attention and rendered assistance. So? Well, I do not distribute attention, another office does that. My business is money. Everybody is pushing and shoving for it within the limits of their power.

And now listen to my calculations.

Each year 60 union and republic ministries belch forth from 15,000 to 20,000 decrees which require immediate revision of financing and credit. An equal number of decrees are adopted by main administrations and all-union production associations. They are eliminated, but the decrees live. It is like the light of dead stars...grandiose documents! The republic councils of ministers adopt fewer of them, but each is more extensive. And what reams of paper I receive from the Gosplan! If it is all right, I will not continue. Do I sound like an old lady?

In 12 months 70,000 papers fall down on my poor head, requiring that I revise something that has already been revised, and redistribute what has already been distributed. During the work day, excuse me, there are 420 minutes, and there are only 250 work days a year. You multiply and then divide and what do you come up with? Every paper devotes special attention and establishes advantage for someone. But this "advantage" lasts for just about a couple of minutes. It is then crowded out by the next "advantage." And if the one who has the first wants to obtain it, he must sit next to my desk and wait until the time from when I receive his particular paper for execution until I begin to read the next one. It is precisely this time interval that is his big chance! He can obtain everything everything he has coming. If he does not manage to do this, he had better watch out for his heels: the next lucky person is right behind him.

Do you understand the subject? Alas, not everyone is aware that in their reserve is just a couple of minutes, that the pie is always smaller than the appetite and there is never enough for everyone. They run with "their" decree like a child with a toy train, and when they see that the train is no longer working, they grab me by the lapels. But who am I--Leonardo daVinci? No, I am only the Gosbank and I only have a couple of minutes for each person.

This is why I am always in a hurry. What? Why did I move the newspaper stand? I cannot walk around any small obstacles! I do not have enough time!

Well, good luck! There is no decree that pertains to you? Oh, there is-- excuse me! Only do not be late, I have only a couple of minutes for you.

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